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The EDISON ELECTRIC INSTITUTE BULLETIN

May
1958

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Accounting Conference Summary

We Will Help
J. W. McAfee

Selecting, Training of Employees
Roland C. Becker

Why We Chose Electric Heat
Hugo E. Beck

Controlling Small Purchases
F. M. Reinhold

How We Selected and Trained System Operators
R. N. Youtz

V26 1958

ELECTRICAL RESEARCH STATISTICS
THE ELECTRIC LIGHT AND POWER INDUSTRY

Current Statistical Data Covering 100 Per Cent of Industry

(Includes Investor-Owned Companies, Cooperatives, and Government-Owned Utilities)

February, 1957-1958

SOURCE AND DISPOSAL OF ENERGY—MONTH OF FEBRUARY

	1958	1957	%
NET GENERATION* (Kwhrs in Thousands)			
By Fuel Burning Plants	39,081,509	38,687,484	+ 1.0
By Water Power Plants	10,974,237	9,978,557	+10.0
Total Generation	**50,055,746**	**48,666,041**	**+ 2.9**
ADD—Net Imports Over International Boundaries	239,386	241,238	− 0.8
Less—Company Use	165,588	154,040	+ 7.5
Less—Energy Used by Producer	1,134,828	1,113,245	+ 1.9
Net Energy for Distribution	**48,994,716**	**47,639,994**	**+ 2.8**
Lost and Unaccounted for	2,007,287	1,423,234	+41.0
Sales to Ultimate Customers	**46,987,429**	**46,216,760**	**+ 1.7**

CLASSIFICATION OF SALES

NUMBER OF CUSTOMERS—As of February 28th			
Residential or Domestic	46,907,053	45,917,947	+ 2.2
Rural (Distinct Rural Rates)	1,648,272	1,617,730	+ 1.9
Commercial or Industrial:			
Small Light and Power	6,209,849	6,114,413	+ 1.6
Large Light and Power	306,611	298,468	+ 2.7
Other Customers	183,761	177,295	+ 3.6
Total Ultimate Customers	**55,255,546**	**54,125,853**	**+ 2.1**
KILOWATTHOUR SALES—During Month of February (Kwhrs in Thousands)			
Residential or Domestic	14,691,112	13,389,223	+ 9.7
Rural (Distinct Rural Rates)	762,181	758,184	+ 0.5
Commercial or Industrial:			
Small Light and Power	7,960,930	7,582,968	+ 5.0
Large Light and Power	21,648,532	22,639,780	− 4.4
Street and Highway Lighting	477,152	440,044	+ 8.4
Other Public Authorities	1,054,342	988,960	+ 6.6
Railways and Railroads:			
Street and Interurban Railways	198,469	209,104	− 5.1
Electrified Railroads	150,367	163,733	− 8.2
Interdepartmental	44,344	44,764	− 0.9
Total to Ultimate Customers	**46,987,429**	**46,216,760**	**+ 1.7**
Revenue from Ultimate Customers (Thousands)	**$811,224**	**$775,742**	**+ 4.6**

RESIDENTIAL OR DOMESTIC SERVICE

AVERAGE CUSTOMER DATA—for 12 months ended February 28, 1958			
Kilowatthours per Customer	3,219	3,004	+ 7.2
Average Annual Bill	$82.08	$77.80	+ 5.5
Revenue per Kilowatthour	2.55¢	2.59¢	− 1.6

* By courtesy of the Federal Power Commission.

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The objectives of the Edison Electric Institute are:

The advancement in the public service of the art of producing, transmitting, and distributing electricity and the promotion of scientific research in such field.

The ascertainment and making available to the members and the public of factual information, data, and statistics relating to the electric industry.

To aid its operating company members to generate and sell electric energy at the lowest possible price commensurate with safe and adequate service, giving due regard to the interests of consumer, investor, and employee.

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The EDISON ELECTRIC INSTITUTE BULLETIN

May, 1958

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CONVENTIONS AND MEETINGS

1958

JUNE

5- 7 Northwest Electric Light & Power Association Accounting & Business Practices Section, Olympic Hotel, Seattle, Wash.

6 Public Utilities Association of the Virginias Accident Prevention Conference, Hotel Roanoke, Roanoke, Va.

8 PIP Steering Committee and Inter-Regional Committee Meetings, Boston, Mass.

9-11 EEI 26th Annual Convention, Boston, Mass.

22-25 Michigan Electric Association Annual Convention, Grand Hotel, Mackinac Island, Mich.

23-24 EEI-AGA Depreciation Accounting Committee Meeting, Cornell Heights Residential Club, Ithaca, N.Y.

22-27 AIEE Summer General Meeting and Air Transportation Conference, Statler Hilton, Buffalo, N. Y.

JULY

18 Oklahoma Utilities Association Accounting Section Conference, Ardmore Hotel, Ardmore, Okla.

AUGUST

4-29 Southeastern Electric Exchange Public Utility Executive Course, Georgia Institute of Technology, Atlanta, Ga.

SEPTEMBER

8- 9 EEI-AGA 1958-59 Accounting Division and Section Organization Meeting, Netherland Hilton Hotel, Cincinnati, Ohio

12-13 Maryland Utilities Association 34th Fall Conference, The Cavalier-Sir Walter Raleigh Hotels, Virginia Beach, Va.

14-17 Rocky Mountain Electrical League Annual Fall Convention, Jackson Lake Lodge, Moran, Wyo.

17-18 PEA 51st Annual Meeting, Penn Sheraton Hotel, Pittsburgh, Pa.

17-19 Northwest Electric Light & Power Association 51st Annual Meeting, Sun Valley Lodge, Sun Valley, Idaho

18-21 Public Utilities Association of the Virginias 40th Annual Meeting, Greenbrier Hotel, White Sulphur Springs, W. Va.

22-24 EEI Meter and Service Committee, Driscoll Hotel, Corpus Christi, Texas

29-30
Oct. 1 Eleventh Annual Round Table Conference, Drake Hotel, Chicago, Ill.

1958

OCTOBER

1- 3 Indiana Electric Association Annual Convention, French Lick-Sheraton Hotel, French Lick, Ind.

1- 3 PIP Workshop Conference, Radisson Hotel, Minneapolis, Minn.

6- 8 EEI Prime Movers Committee, Hotel Statler-Hilton, Buffalo, N. Y.

9-10 EEI Transmission & Distribution Committee, Hotel New Yorker, New York City

13-14 EEI Electrical System and Equipment Committee, Hotel Barringer, Charlotte, N. C.

15-16 5th Annual EEI Area Development Workshop, Hotel Somerset, Boston, Mass.

16 Oklahoma Utilities Association Electric Light and Power Division Conference, Eastern District, Western Hills Lodge, Lake Sequoyah, Wagoner, Okla.

15-17 Wisconsin Utilities Association Electric and Gas Operations & Sales Convention, Schroeder Hotel, Milwaukee, Wis.

16-17 PEA Prime Movers Committee, Skytop Lodge, White Haven, Pa.

17 EEI Area Development Committee, Hotel Somerset, Boston, Mass.

17 Oklahoma Utilities Association Electric Light and Power Division Conference, Western District, Lawtonian Hotel, Lawton, Okla.

20-21 Southeastern Electric Exchange Engineering & Operation Section, Hotel Roanoke, Roanoke, Va.

22-24 EEI-AGA Taxation Accounting Committee, Tides Hotel and Bath Club, St. Petersburg, Fla.

24 Oklahoma Utilities Association Accounting Section Conference, Burlingame Hotel, Bartlesville, Okla.

30-31 Southeastern Electric Exchange Accounting Conference, Roosevelt Hotel, New Orleans, La.

NOVEMBER

5- 7 New Jersey Utilities Association Annual Meeting, Seaview Country Club, Absecon, N. J.

17-21 NARUC Annual Convention, Westward Ho Hotel, Phoenix, Ariz.

30-
Dec. 5 American Society Mechanical Engineers Annual Meeting, Statler and Sheraton McAlpin Hotels, New York City

DECEMBER

1- 3 EEI-AGA Electronics Seminar, Commodore Hotel, New York City

Accounting Conference Stresses Employee Selection, Customer Service, Electronics

PROPER selection of accounting personnel, improved customer service, and the application of electronic machines received major attention at the National Conference of Electric and Gas Utility Accountants in Houston, Texas, last month.

Some 800 accountants, representing the utility industry all over the country, attended the conference, held at the Shamrock-Hilton Hotel, April 14-16. J. Douglas Elliott, The Detroit Edison Co., and chairman, EEI Accounting Division, and Donald W. Peterson, Minneapolis Gas Co., and chairman, American Gas Association Accounting Section, presided at the General Session. The conference was co-sponsored by EEI and AGA.

Keynoting the General Session speeches was Basil B. Elmer, Jr., assistant vice president, The First Boston Corp., who said the traditional 6 per cent return on utility investment no longer is fair. Under present conditions, Mr. Elmer said, a rise in return to 7 or 7¼ per cent should be allowed by regulating commissions in order for utilities to compete for investor funds.

Mr. Elmer predicted that electric and gas utilities in the next 12 years would need to raise about $31 billion by sale of stocks to keep up with the expanding needs for electric and gas power.

John H. Wimberley, president, Houston Natural Gas Co., surveyed the economic changes in the Houston and Texas Gulf Coast area, since World War I, and pointed out the new and tremendous importance of the World War II-spawned petrochemicals industry.

The utility accountants were welcomed to the conference in Houston by W. A. Parish, chairman, Houston

Participating in the Accounting Conference General Session were, top row, from left: Basil B. Elmer, Jr., the Rev. Roger C. Schmuck, W. A. Parish, John C. Flanagan, John H. Wimberly. Bottom row, from left, are: Chester S. Stackpole, Edwin Vennard, J. Douglas Elliott, and Donald W. Peterson.

Lighting & Power Co., and by John C. Flanagan, vice president and general manager of Texas Operations, United Gas Corp. The accountants represented member companies of Edison Electric Institute and the American Gas Association. Chester S. Stackpole, managing director, AGA, spoke of the fact that even in a competitive industry, there were "areas of mutuality of interest," such as accounting where competitors could work together with mutual benefit. Important strides are being taken particularly in the application of electronic machines to utility accounting.

Edwin Vennard, vice president and managing director, EEI, forecast continuing growth trends for utilities as a group. Though service has been extended to practically all customers, especially by the electric utilities, Mr. Vennard saw no leveling off in future demand. Per capita use will continue to increase, he said. The sudden growth of air conditioning is an example of new, large outlets for electric and gas service.

Customer Activities Group

"Centralization of Customer Accounting Records versus Decentralization" highlighted the Tuesday morning general session of the Customer Activities Group. A panel discussed the merits or faults of the subject. In addition a thorough discussion, a very comprehensive report was distributed to those in attendance. Another subject of great interest was a paper on "Selection of Personnel for Electronic Programming." The Wednesday morning program was spearheaded by Dr. Morris S. Vitelis, psychologist, who discussed "Psychological Testing in the Selection, Training and Development of Key Personnel."

Other speakers included Kenneth R. Hinckley, who talked on "A Closer Look at Customer Opinion Polls." A panel discussion on "Company-Wide Viewpoint on Final Bills" also was presented. All of the talks presented at the sessions will be printed in the proceedings of the convention.

The customers' accounting committee covered seven projects at their meetings.

One of the features of the meeting of the Customers' Accounting Committee was a new technique in conducting a truly conference type discussion. This technique was used by the project committee on "Electronics for Customers' Accounting" in the meeting on Tuesday afternoon and was referred to as a "Floor Discussion on Electronics for Customers' Accounting." In order to facilitate discussions, chairs were arranged in a semicircle thus bringing members of the participating audience closer to one another and to the moderator. In a brief introduction of the subject, the moderator distributed a list of 17 basic questions and suggested ground rules for orderly discussion, designed to control discussion from the floor and encourage participation on a broad scale.

The committee members, as part of the audience, were prepared to offer comments from time to time to facilitate discussion and point up significant advances which have been made in this field in the last year.

These comments were based on special report material prepared by eight gas and electric utilities for the committee who have exercised leadership in the field of electronics for customers' accounting. During the two-hour meeting there was a continuous informal and uninhibited discussion by many in the audience. The Customers' Accounting Committee plans to consider this type of conference technique for future meetings.

The Customer Collection Committee covered four projects at its meetings. The highlight of the meeting was the return to the old-fashioned "bull session" discussion. "Ulcers Unanimous" was the title for the subject and while this was originally billed as a panel discussion, it soon became a wide-open discussion with all of the people in attendance participating in the arguments. Many an ulcer was reactivated at this meeting.

The Customer Relations Committee covered six subjects at its sessions.

Electronic Accounting Machine Developments

The Electronic Accounting Machine Developments Committee presented four papers:

"Computer Comparatives—The Development of SPAN," by R. E. Anderson, assistant secretary, Aetna (Fire) Insurance Co. Project Director—SPAN; "Status of Computer Developments and Applications," by Dr. Howard H. Aiken, director, Computation Laboratory, Harvard University; "How Automatic Is Automatic Programming?" by E. Devere Cowles, The Detroit Edison Co., and "Progress Report—Harvard Research Project," by Walter J. Ott, The Cincinnati Gas & Electric Co.

SPAN is a cooperative effort by four competitive insurance companies to use an IBM 705 computing system for data processing purposes. Individually, any one company could not economically justify a large scale computer, but could on a joint cooperative venture.

The computer has been installed, and the various data processing operations are gradually being converted to the computer. Up to the present time, there apparently have been no unusual difficulties, and each company shares the cost of the electronic data processing operation equally regardless of size.

Dr. Aiken spoke on current developments in computer technology.

Harvard Research Report

A brief progress report on the Harvard Research Project was presented by Mr. Ott. Progress Report No. 7 has been submitted to the Steering Committee by the staff of the Computation Laboratory. This report proposes two small electronic computer systems; which are quite similar, to handle the revenue accounting functions of a utility company with 50,000 meters.

A report was presented on the development of automatic programming techniques. A summary of automatic programs available indicates that considerable progress is being made in this area by manufacturers. It was suggested that future developments should concentrate on the development of common language in automatic programming to facilitate the interchange of programs among various types of computer systems.

"Selection of Personnel for Electronic Programming," by D. J. Pizzimenti, The Detroit Edison Co., reviewed the procedure followed by Detroit Edison in selecting programmers. In cooperation with the company's psychologist, the personnel department developed several tests, including an IBM test, for use in evaluating applicants for the programming staff.

In addition to the tests, other factors considered were the employee's education and experience, his general

work history, attitude, and other characteristics.

The applicant had to have at least a high school education. Only those whose test scores were in the upper 25 or 30 per cent were selected for subsequent personal interviews. It is interesting to note that two out of the 20 programmers at Detroit Edison have college degrees, and about half have up to two years of college education. The 20 programmers represent almost all departments in the company. The oldest man is 38; the average age is 28.

"Auditing EDP" was presented by H. R. Symes, The Detroit Edison Co., for the Internal Auditing Committee. Auditing techniques required for handling data processing systems were covered. It was emphasized that this is a preliminary summary since no complete program has been developed for auditing in a company with a large scale computer. The paper discussed Detroit Edison's approach to "auditing EDP equipment." It was suggested that because the computer provides the opportunity for controls, it will result in minimizing auditing procedures. It was suggested that one of the primary concerns of the auditors will be to insure the accuracy of the input data. It will be important to develop procedures not only to detect errors but to provide for the necessary corrections.

Auditing techniques will be changed substantially by EDP. The computer permits the use of larger volumes of data for auditing of controls. Where a manual system may use 200 accounts for a unit of control, the computer permits the possibility of using 35,000 accounts of units of control. The auditor will also have to utilize records when they are available from the computer during a periodic printout. Whereas before, the data were available on a current basis for visual reference. It is also felt that a computer can be used by the auditor to perform much of the detailed work which is presently done manually.

"Comforting Customers with Computers," by E. A. Menke, Commonwealth Edison Co., reviewed the current status of computer operations at Commonwealth Edison and Detroit Edison. The purpose of the paper was to discuss the current results as they affect customer relations. Commonwealth Edison feels that the computer system provides sufficient information to handle the majority of customers' inquiries without impairing customer relations. This is accomplished primarily by printing out a complete bill register for every account. The speaker stated that as a result of the computer operations, bills are in the mail 3-4 days after meter reading. Commonwealth Edison also feels now that they will realize annual savings of $750,000.

Detroit Edison follows the same basic principles in its computer operations but uses an individual ledger for each customer rather than a bill register. The company states that in the computer system, they have lost some information which they had in their system, but the data is always available to answer customer inquiries. This was impossible with their old punched card system. The company does not feel that it has bettered its customers relations as a result of installing an electronic system.

The report contains pictures of customer inquiry stations and sample forms.

"Applications for Electronic Computers," by John G. Cadby, Wisconsin Electric Power Co., reviewed the progress currently being made in the use of electronic computing machines in applications other than customers accounting. A summary of other areas indicated that considerable progress is being made in the use of computers for engineering problems and for many functions in general accounting such as: accounts payable, plant accounting, budget preparation, transportation, depreciation, stockholders' records and dividends, employee data, fuel accounting, materials and supplies, payroll, and forecasting.

General Activities Group

In addition to the individual committee sessions, the General Activities Group held sessions on Monday and Tuesday afternoons, April 14 and 15, in which the various committees participated.

Thomas J. Graves, a partner of Haskins and Sells, opened the Monday session with a talk on "Reimbursed Expenses." The delegates were considerably relieved to learn that the regulations had been eased so that it was unnecessary to maintain the detailed record of expenditures, envisioned by the initial instructions.

A panel discussion entitled "Industrial Practices in Computing Liberalized Depreciation" proved to be both entertaining and enlightening.

Lester E. Reynolds, Connecticut Light and Power Co., was assisted by panel members Joseph W. Prenger, Everett M. Holwick, C. E. Pullum, Carl P. Allman, Frank H. Carey and John B. Madigan. The discussion covered the extent to which utilities are using liberalized depreciation for income tax purposes, methods in use, to what property it applies, use of composite average service lives, cost of removal and salvage, maintenance of reserves, records maintained and the increased cost of record keeping occasioned by liberalized depreciation.

The Tuesday afternoon session began with a talk by Allen O. Hinkle, general auditor, Humble Oil and Refining Co. His address, "Opportunities Unlimited," extolling the southwest and enumerating the opportunities therein, emphasized how the accountants could play an important part in the growth of this area.

Alex R. St. Bernard, The Cleveland Electric Illuminating Co., delivered a paper entitled "You Can Improve Accounting Service and Save Dollars." It was based upon a questionnaire developed by the General Accounting Project Committee, and was an attempt to determine how the accountants appraise themselves as management-minded controllers and interpreters of the financial aspects of the business. The questions generated by this self analysis should be a challenge to our objectivity in self analysis.

The Tuesday session closed with a panel discussion on "Responsibility Accounting—Who and How." Kenneth P. Locke, The Detroit Edison Co., served as moderator and he was assisted by panel members John E. Carlson, Raymond M. Harbaugh and J. E. Theobald. Responsibility accounting identifies costs by individuals who are assigned authority to incur costs and are held accountable for such costs, within prescribed limits. Frequently this system crosses functional lines but it offers the advantage of isolating situations which may be at variance with desired objectives. Participation of supervisors and others in the preparation of budgets is essential in the development of methods and measurement of work performance. The practical applications, results and problems of individual companies were discussed.

Vendor and Warehousing Operations Stressed at Purchasing and Stores Annual Meeting

PROBLEMS of electric utility company purchasing and warehousing operations received major attention at the Eleventh Annual Meeting of the EEI Purchasing and Stores Committee in Minneapolis, April 28-30. Representatives of nearly 100 companies attended the meeting.

The Purchasing and Stores Committee is under the chairmanship of T. S. Dunstan, Consolidated Edison Co. of New York, Inc., who opened the meeting.

One of the most important sessions of the meeting was a joint purchasing-stores panel discussion on Tuesday, April 29, with G. H. Cole, Alabama Power Co., and vice chairman, purchasing, moderating. Panelists were F. R. Schaffer, Pennsylvania Power & Light Co.; R. B. Gear, Commonwealth Edison Co.; W. N. McClelland, Consumers Power Co., and J. D. Hogg, The Cleveland Electric Illuminating Co.

Gear Discusses Vendors

Mr. Gear, in reporting the findings of a Commonwealth Edison Co. project group, said that vendor delivery problems, which are mutual problems of buyer-seller relationships, all but disappeared in the past year. He added that vendors are generally giving the services required by the utilities. Buyers and suppliers should "work together to eliminate the unnecessary problems and keep the others to a minimum," he suggested.

Mr. Gear suggested these points to utility buyers: 1. Furnish the vendor realistic delivery dates; 2. insist on the vendor living up to delivery dates; 3. keep company and company-vendor communications channels active, and particularly, inform the vendor of any changes in order requirements; 4. keep acquainted with the economic side of your company, as well as with market trends.

Mr. Schaffer, explaining that the trend is toward more extensive use of the non-returnable reel, said criticism has diminished and acceptance of this type is growing. Problems involved in the use of containers often were said to be nothing more than conditions which can be easily overcome, by a certain amount of good judgment and ingenuity, he said. He reported that consultations with several companies showed procedures and practices of stocking to be fairly uniform.

McClelland Speaks

Mr. McClelland discussed the growing utility industry practice of buying, storing and issuing pre-assembled units, rather than many components. Advantages of this practice were listed as follows: expedites the filling of requisitions because it is easier to issue one item rather than a group of parts; reduces the clerical work and possibility of errors.

Also, saves engineering time in making up bill of materials for construction jobs; where the assembly is made up by stores personnel, it can be done during the non-rush hours of the day; where the assembling is done at the vendor's plant, it can be done more economically than in the field by construction workers.

Also, expedites the return of excess material from a job back into stores; saves time in emergencies for both the storekeeper and line crew; speeds up inventorying of materials; eliminates waste due to overordering by the field forces.

Mr. Hogg said that in recession times the advantages of leasing, unless capital is difficult to secure, are less than in boom times. This he attributed to borrowing interest rates as well as purchase prices paid by utilities, which tend to be lower. However, he added, both these factors, when considered over a long period, work in favor of leasing.

W. S. Marks, manager of stores and inventory control for Commonwealth Edison Co., pointed out that inventory control has to be a cooperative venture. Engineering, construction, operating and inventory control personnel must work to keep dollars tied up in inventory at a minimum, he asserted.

A study by The Detroit Edison Co. may indicate that a statistical sampling method will provide the adequacy of correctness essential in the successful operation of a mechanized stock control system. It is one of many improvements contemplated in a continuing effort to increase the efficiency and effectiveness of mechanized procedures in use at Detroit Edison for nearly 20 years. J. A. Longyear reported that further mechanization is expected as the potential of the present-day computer is utilized.

A Purchasing and Stores project group headed by W. H. Brueggemann, Wisconsin Electric Power Co., reported that more and more companies are adopting some form of an exempt material plan. While it will increase the hazards of losses in materials due to carelessness, overstocking, understocking or diversion of materials, Mr. Brueggemann said, the savings resulting from reduction in cost of materials handling and accounting operations will more than offset any losses resulting from reduced storeroom controls.

King Seeks Data

Seeking to obtain a realistic measure of stores performance, a subcommittee headed by R. S. King, Union Electric Co., asked EEI member companies to furnish 1957 data on number of stores manhours and value of net issues.

D. J. Fitzgerald, The Baltimore Gas and Electric Co., said there is only a slightly greater tendency on the part of the larger utilities than the small ones to enter into vendor stocking arrangements. In a survey by his project group, only six cases were reported where a premium charge was paid to vendors for the stocking of materials to be delivered ultimately to central warehouses and only 10 for deliveries to outlying stations. This compared with 251 cases where no extra costs resulted from deliveries to central warehouses and 222 to outlying warehouses.

E. J. Martin, New Orleans Public

(*Continued on page* 160)

We Will Help

By J. W. McAfee

President, Edison Electric Institute

An address before the American Power Conference, Chicago, Ill., March 27, 1958

THE electric light and power business is one that is singularly addicted to the use of numbers and statistics. This addiction was brought about by the need for planning in our business. Generating plants, dams, and transmission lines are not built overnight; long before they are scheduled to go into service, the men in the power company must discover when they will be needed, where they should be located, and their cost.

Industry Plans 10 Years Ahead

This industry does its planning five and 10 years in advance. While it is difficult to predict that far ahead with absolute accuracy, we must try. Because the power companies have planned in advance to have ample generating capacity on hand for any future need, America has never been stymied for lack of electric power. Whenever a new industry has sprung up or whenever a new machine has been invented, the electric power has been there to run it. This fact goes a long way toward explaining America's bountiful prosperity.

Because our business requires that we make fairly accurate estimates of the future demands that are likely to be placed on us, we are interested in growth curves, trend lines, and projections. Truly, in our industry, numbers have a real meaning; but by no means do they tell the whole story.

Today, let us depart from the realm of numbers and discuss the electric power industry in terms of its relationship to the nation as a whole. It is fitting that we do so at this time, because our nation is facing a number of challenges which it must meet and overcome. It behooves every citizen and every business at this time to think in terms of what each can contribute toward the common good.

Missiles

One of the problems facing America today was elevated to the status of a national controversy on October 4, 1957, when the Russians launched the first successful earth satellite. With that launching, the Age of Space was heralded in. Man has long dreamed of visiting strange planets; he appears to be on the verge of bringing those dreams into reality. Because of the newness of the idea of missiles and rockets, the two Sputniks have caused an apprehensiveness in the minds of the people that was not completely allayed by the launching of our own.

Any new scientific development is apt to be regarded in the same way. About 65 years ago, when our industry was just barely getting started, Mayor Carter Harrison of Chicago, objecting to our planned distribution system, said, "We do not want death dashing like a horrid monster through our streets." The old saying is true; we fear that which we cannot understand.

Americans ask themselves, "Are we ahead, or are the Russians ahead?" Unfortunately we cannot know for sure.

Economic Matters

Russia poses yet another problem. On the economic front, Khrushchev has said, given peaceful economic competition, "We will bury you." He has begun to translate his words into deeds through a global economic offensive aimed at snapping up uncommitted nations. Since 1945, world Communism has been progressing at the rate of 44 square miles of territory and 7,000 people per day; that is the average rate of "conversion" which the Communists have been able to accomplish.

There are those who take a pessimistic view of the survival of freedom, in light of man's past record on earth. They suggest that the world is again moving inexorably back to tyranny. The tyranny they fear is Marxism and its philosophy of the all-embracing state—of the subjugation of individual rights and freedoms for the alleged good of the masses.

This country is the admitted leader of those who defend the freedom and the dignity of individuals. Whether pessimist or optimist, one must admit that we are faced with a serious challenge. However we evaluate the degree of danger, we feel the pressure from the Russians abroad, and we feel the effects of the adoption of socialistic concepts and the strong drift toward big government at home.

Scientific Education

Quite a different problem is presented in the field of engineering and scientific education. During the past several years, we have witnessed a crescendo of complaints about our education system, particularly as it relates to scientific training. The fact is plain that we are not producing the scientific and technical manpower our nation will need in the future.

The problem doesn't stop there. Our whole educational setup must be kept abreast of the rapid pace at which the world is moving. While acknowledging the necessity for scientific training, we must not let the excitement of the moment obscure the fact that, to our country at least, the humanities are just as important.

Atomic Energy

Closer to our own business is the subject of atomic energy. In this field, the real issues and facts have become clouded. The development of atomic energy offers us an opportunity to enhance our world prestige. Our industry will continue to play an important part in that development.

These, then, are some of the problems facing America today. They are crucial ones. How well we do as a nation in solving them will have a bearing on the role America will play in the world of tomorrow. Let us examine each of them to see how the electric power industry can help to further our nation's efforts to solve these problems.

Sputnik and Related Issues

Missile and rocket experts seem to agree that in this narrow phase of military operation, Soviet Russia has the edge on us. How much of an edge we cannot tell.

There are some things we do know about the relative ability to produce.

Russia's steel production, for example, rose from a 1937 production of 17.7 million tons to 55.8 million tons in 1957. By comparison, American steel production moved from 51 million tons to 112.5 million tons during the period 1937 to 1957—a gain for the Russians of 38.1 million tons; a gain for us of 61.5 million tons.

In electric power, Russia has expanded its capacity from 11 million kw in 1940 to its present capacity of 42.8 million kw.

America is the leading nation of the world in the production of electric power. From a capacity of 51 million kw in 1940, we have grown to the present 128.7 million kw. America has more electric power capacity than the next six nations of the world combined. We have more than three times the capacity of the next ranking country, Soviet Russia.

We cannot say that the Russian growth in producing capacity, particularly on a percentage basis, is not impressive or that it should not be viewed seriously and realistically. However, it does not justify the almost hysterical cries of alarm that one hears from some quarters. The cold facts are that our increase in tons of steel and in kilowatts of energy in the last two decades greatly exceed those of the Russians. It is tons and kilowatts—not percentage points—that can be turned into goods.

It is obvious that Russia has been concentrating a large portion of manpower, materials and facilities on the production of war goods. This has a number of implications. First and of immediate importance is the obvious necessity of devoting sufficient of our resources to defense to protect the country and to sustain the respect and confidence of our allies even if that should ultimately require some sacrifices in our civilian economy.

This, of course, is a trite and repetitious statement. But putting the principle in practice, if it must be done, may be a different matter. The sacrificial spirit is not current in the U. S. In fact, the opposite is clearly apparent. The pressure for a higher living standard, more security and a better return on investments is strong. It is laudable that we aspire to a higher life; it leads one to wonder, however, if we are preparing ourselves to do what one day may be a necessity.

Our industry is one of the prime factors in maintaining a strong and dynamic industrial base, and we intend to continue to provide an abundance of electricity, now and in the future. We will produce this electricity at the lowest price consistent with good service. We plan to maintain adequate reserve generating capability, so as to be in a position to meet any need for electric power which may unexpectedly arise, either from the military or from the civilian economy.

Our engineers are continually on the lookout for possible improvements in the technique of generating and distributing electric power. We have substantially raised the average capacity of generating equipment being installed, the voltages at which power is transmitted and the efficiency of our generating cycle. We are now carrying on research which should result in further improvements in the years to come.

The year 1958 will be a record year for new construction in the power business. During this year, we will install 16.5 million kw of new generating plant. This will place our reserve capacity at its largest figure in postwar years. This means that the growth of our industrial base will not be stunted for lack of electric power.

Economic Matters

Although we do not particularly enjoy a cold war situation, it is better than a hot war. At least we have peace, an uneasy peace though it be. In economic terms, however, the situation is different; we are up to our ears in an economic war. Russia is trying to force us out of world markets. Where she cnnot beat us with the economic weapons she has at hand, she is trying to get us to waste our wealth and our resources.

At first glance, the picture here is not as bright as it has been; but again, let us not be misled by statistics. We are not headed for the rocks; far from it. There is an undercurrent of deep and abiding faith in the strength of our economy. It has been correctly described as a breathing-spell, taken while we are digesting the great gains that have been made in the past. Most economists believe, despite the apparent downtrend, that forces are at work which will, probably within the year, begin to have a stimulating effect on our economy. We in the electric power industry intend to give those forces all the help we can. Here are some ways in which this industry will help to keep our nation on a firm economic footing:

First, we can help by maintaining stability. Ours is not a volatile or seasonable industry. We do not have periodic layoffs; we can maintain stability of employment and thus add to the stability of the communities in which our employees live, the stores where they buy, and the many suppliers of commodities and services that they patronize. Our day-to-day purchases of materials and supplies and of contract services will be steady. Although our orders for generating equipment are placed according to a timetable, the orders will be placed when called for.

Second, we can help by continuing to assume our share of the tax burden. In 1957, the investor-owned power companies paid a total of $1.8 billion in Federal, state, and local taxes. Because of our inherent stability, our tax payments are not likely to vary greatly with variations in the economy. Since in a great many cases the local power company is the largest taxpayer in the area it serves, the stability of tax revenue can go far to stabilize the economies of the city, county, and state governments. Our contributions toward Federal taxes, $1.1 billion, is nó mean sum. That will buy a good number of atomic submarines, rockets and missiles.

Third, we can help by buying carefully to avoid compounding any inflationary trend which may be in the offing. This applies not only to the power industry, but to all industry and all people. Where buying is done on a crash basis or a careless basis, the possibilities for encouraging inflation are present. It behooves all of us to resist with all our power the ruthless force of inflation, which takes most away from those who can least afford the loss.

In the same connection, we will help by continuing to take advantage of every opportunity for increased efficiency of operation, to keep the price of our product—electricity—low. We are proud to be able to say that although the cost of living is now 270 per cent of what it was in 1913, the average price of household electricity is less than 30 per cent of what it was then. We intend to do everything within our power to continue this trend of ever-decreasing average price. While costs are catching up with us, and some rate increases may

be needed, the promotional rates which our companies have historically used should nevertheless keep the average price per kilowatt hour on the decline.

Fourth, we will help by doing our share, with the other citizens of the nation, in assuming whatever work we can, thus to relieve the government of unnecessary burdens. Our industry stands ready at any time and at any place to finance and build power facilities to serve any group needing electric service, at the lowest possible price consistent with good service. We will take our place with other industries and other citizens in helping to assume whatever burdens we can, so that the government's strength and substance may be available for international economic—and perhaps military—warfare.

Need for Sound Economy

Whether the international challenge be in terms of economic warfare or actual combat, the outcome will rest in large measure on the vitality of our economy. It has been our economy, our productive might, which has seen us safely through two world wars. In each, we were a late starter, but the flood of military hardware running from our production lines soon engulfed the enemy. Without a strong industrial and economic position, we might have suffered defeat. We must keep our economy strong if our defense is to be strong.

If that is true in the case of outright and open competition, either in world markets or on world battlefields, it is equally true in another battle in which we are engaged: the fight against subversion.

We have long known that there is an active Communist Party in the United States. It consists of a devoted band of about 80,000 people—the hard core—bent on converting our nation to the Soviet pattern. In addition, for every one of these, there are 10 sympathizers, many of whom are not fully aware of the fact that their support of what they see as idealistic objectives is a weakening element. Their tactics are well-known, but nonetheless effective. Their efforts are directed at creating confusion in times of crisis, disguising issues at times for decisions, encouraging mistakes, and engendering fear. The soap-box oratory they do today is mere window-dressing. Like an iceberg, the greater bulk of their insidious efforts is directed toward areas where it is least suspected and seldom observed.

These people have been told that our economy is our salvation. They have instructions to take every opportunity to debauch that economy. The reason is obvious: where the economy is strong, communism and socialism—which are essentially economic systems, not political systems—are not needed or wanted. There is no need to cite communist successes to demonstrate that the more susceptible nations are those with the weakest economies. We need look only as far as our own country, after the Great Depression, to see how collectivists are able to operate when the economy is weakened.

Engineer Shortage and Scientific Education

The challenge presented by Russia with the launching of its satellites captured the American imagination. A glamorous, Buck Rogers development coming from the other side of the ocean stirred at least some feelings of envy. More than once the question was asked: "Why don't we have one?" It was this public clamor which finally made the subject of education a live one. In that regard, at least, the public reaction was constructive.

In our industry, where the work of the engineer is so important, we are particularly concerned. Over a year ago, Edison Electric Institute, the trade association of investor-owned power companies, organized a strong committee to look into this situation. Other committees took interest, and our whole industry has become alerted to the probable causes and probable cures for this shortage.

Need for Engineers

Our best estimates indicate an annual deficit in engineering graduates from now until 1960 at 3,200. As our society moves into a higher plane of mechanization and automation, with more dependency on machines and mechanical equipment both in the home and in the world of industry, the need is going to increase sharply. The supply will increase too, but not enough to prevent the annual deficit from reaching 15,900 engineers.

By far the greatest step toward correcting this problem has been taken: The American people have been awakened to the need. We know from our experience in the past that this need will be met. Our educational institutions have responded by analyzing their facilities for producing engineers and scientists. Our government has taken steps to help.

However, a great deal more has to be done. All we have done so far is arrived at the conclusion that there is a problem. Work toward its solution must come from all segments of our society. We in the electric business are doing our share.

First of all, we are reappraising our utilization of engineers. We are trying to find ways of getting many technical jobs done without burdening our supply of engineers. This inevitably means hiring a greater proportion of technicians, and training up others of our employees to take over technical functions of a higher order.

Better Salaries Offered

Second, in response to the American free market principles of supply and demand, we are offering better salaries to engineers than we ever have before. It may surprise some of you to learn that the power companies generally offer better salaries to beginning engineers than does industry as a whole. These bigger salaries, it is hoped, will inspire more young people to follow scientific careers.

Third, we can help the other citizens of our communities in their efforts to strengthen and improve the processes of education. In this respect, the utility is in an unusual position. If we get tired of a community, we cannot pick up our generating equipment and our distribution lines and move out. We are in that community to stay. If it goes down, we go down with it. For this reason, we have more of a stake in the community than some other industries. This has had its effect on power company policies. We are committed to our communities, and will take every possible step to make them strong and good.

Accordingly, where communities demonstrate an interest in improving the quality of and re-evaluating the effectiveness of their schools, the power companies will work with the citizens to encourage better education and to promote interest in scientific subjects.

In trying to understand the attitudes of our society today there is one element that gives cause for concern. There is evidence of a national in-

security that could become psychopathic very easily. It is not unlike the situation that developed in England at the time of the French revolution and which led to a great many unwise actions including the conduct of the sedition trials.

There appears to be a growing emotional insecurity that interferes in many ways with calmness of judgment and prudence of action. Take the launching of the Russian satellites, a very important development and one calling for thoughtful reappraisal: it did not justify frenzied expressions of apprehension and shock or complete blindness to our many assets and attainments.

A few years ago, we developed the first atomic powered submarine, an extremely difficult and valuable attainment. It is frightening to think what the reaction would have been if the Russians had built the first one.

Another manifestation of this feeling is the question, "Are we ahead?" in missiles, in atomic developments or in any other category. What differentiates the implications of the question from wholly healthy and stimulating determination to prevail is that so few are considering "ahead in what way?" and "Is it worth the cost of being ahead on a particular item?"

Nuclear Power

Nowhere is this point better illustrated than in the field of nuclear power. The American attitude seems to be that we must be ahead in everything, regardless of its practical value or importance. They forget that there are many countries, particularly in the Orient, which are grossly ahead of us in producing energy by human effort. In this area, for example, no one in his right mind would urge that we abandon machine production to get "ahead" of the other nations of the world. While not the same, a similar situation exists with respect to nuclear power.

It just happens that there is no nuclear reactor that anyone can build today that will give as good an economic result as a modern conventional power plant. What do we have to gain by engaging in a race to produce the greatest quantity of what for us is an uneconomic facility? Let us not waste our strength in racing toward someone else's goal.

Rather, our goal should be quality. We should build sufficient of each promising reactor type to test its potentials fully. Let us use our energy to pursue the science of matter to the end that we develop a reactor system that will represent a forward step in our productive ability.

What if fuel availability and cost in other countries justifies a different approach overseas; does that warrant our ignoring our advantages and pursuing a wasteful course here?

It is possible that building a large quantity of nuclear power capacity would temporarily make an impression abroad. However, the factor which has given us world leadership is the use of our national resources in the most efficient and economical manner to attain superiority in ability to produce. It has given us the highest standard of living, it has won our wars and it is a course which will serve us in the long-run future.

The electric utility industry is and has been for some time quite active in the field of nuclear power. Three nuclear power plants in which utility companies are participating were completed and began operation in 1957. There are four more important projects on which construction is under way and there are at least two more for which definite commitments have been made.

In addition, a great many companies are active participants in research groups with objectives which it is hoped and believed will lead to additional projects.

The industry has definite plans for the expenditure of approximately $500 million on these projects. About one-half of that amount will have been actually expended by the end of 1959. The hullabaloo about atomic power has obscured the fact that it has always been a slow and expensive process to convert a scientific discovery into economic producing facilities.

When the genius of Thomas Edison invented a practical process for transmitting and using energy in the form of electricity, this country went earnestly to work in the development of the steam engine to the highly efficient instrument it is today. The work is not complete and no year has gone by since Edison's time without an improvement in the efficiency of conventional generating equipment. These accomplishments have not been brought about by wasteful expenditures to appease public clamor and temporarily

(*Continued on page* 158)

1958 Edition of 'I Want to Know' Is Available

AVERAGE residential use of electricity in 1957 for the first time exceeded 3,000 kilowatthours, according to the 1958 edition of "I Want to Know About the Electric Industry," an information booklet just published by Edison Electric Institute.

The electric utility industry's progress in many areas of its operations, including increased sales, expanded generating facilities and atomic energy development, is traced both in text and tabular form in the new edition of the booklet.

New Features

A question about the taxes which the industry pays; use of color inside the booklet; and a page of six convenient charts covering generating capacity, electricity production, kilowatthour sales, customers, residential use and cost, and construction expenditures are new features of the 1958 "I Want to Know."

In addition to the latest available figures, estimates of future prospects are included wherever appropriate. The 10th in a series started in 1948, the booklet is in the form of 29 questions most often asked about the electric utility industry, with detailed, and often tabular, answers.

Kwhr Use Reaches 3,174

The booklet reveals that:

Average residential kwhr use climbed to 3,174, an increase of 205 kwhr over 1956; over $4 billion has been scheduled in construction expenditures by investor-owned companies in 1958, an increase of 10 per cent over 1957; more than 120 companies are participating in atomic power projects; and taxes, the largest single item of expense of investor-owned electric companies, amounted to nearly $1.86 billion in 1957, equivalent to 23 per cent of electric operating revenues.

The booklet may be ordered from Edison Electric Institute, 750 Third Ave., New York 17, N. Y., for 25 cents per copy, for one to 99 copies. Prices for larger quantities provided upon request.

A 1958 Approach to the Selecting and Training of Employees

By Roland C. Becker
Resident Manager, Central Hudson Gas & Electric Corp.
An address before the National Conference of Electric and Gas Utility Accountants, Houston, Texas, April 15, 1958

ALL gas and electric utility companies today, as never before, are concerned with retaining, developing, and improving good customer and public relations. We all are striving to see that the customer relations activity in our companies are carried on by competent and effective employees who are able to meet and dispose of any situation or problem presented by its customers, and retain their good will.

How to Get Best Employees

The problem facing us is how do we get employees who have that extra something, who will develop into the kind of employee we want for this most important and interesting work. How can we properly screen them to assure ourselves that they have the traits and temperament that are essential as a base for the training they will be exposed to before they are qualified to meet our customers?

A further problem facing us is the one of rapid turnover with our female help. Many are leaving before they can be properly trained to contribute any constructive or productive work. I know that many Customer Relations managers are forced to place untrained employees in positions of responsibility and in positions where knowledge of company policies is essential and can only be gained by experience.

Who are customer relations employees? Every employee in our company is a customer relations employee, either directly or indirectly. We must, however, recognize and realize that the customer relations activity, which directly affects the public, is one of the most important activities in our company. Employees of the highest calibre should be made available either from within the organization or by direct hiring to fulfill its mission of making friends of our customers, upon whom the continued growth and existence of our industry depends.

Our committee does not have all the answers to these problems, but a review and a full discussion of them may stimulate our thinking and develop ideas that may be helpful to all of us.

Let us then attempt to determine what we are looking for.

1. An employee who has had experience with the company, preferably some branch of the customers accounting or service department; one who has been tried and proven.

2. One with tact who has the ability to get along with people, because without this all-important trait, knowledge and experience are of no value.

3. One who has a clean cut appearance—not necessarily pretty or beautiful or handsome, but wholesome, neat and personable.

4. One who will have the ability to use mature judgment, not because of age or years of experience, but because he uses common sense in his thinking.

5. One who has the ability to learn and to think clearly.

6. An employee who will develop a keen interest and proper attitude toward the work and responsibilities of the department.

7. An employee with a good speaking voice is essential because good quality, proper diction, and clarity of expression assists in transmitting thoughts and ideas to others.

8. A patient person who exhibits poise will create an atmosphere of confidence which should enable him to meet the many trying situations presented each day.

9. A friendly person. Friendliness is important. If we want our customers as friends, we must develop friendship through friendliness by our employees.

10. A tolerant person. Due to the nature of our business we must render service to all classes of customers and they should be treated alike to avoid discrimination.

11. A male employee if the objectives of the job can best be achieved by a man—a woman if she is more suitable, with serious consideration given to the matter of turnover and the economics of the situation or any prohibitions under a working agreement.

12. An employee between 25 and 35 years old, but preferably no younger than 20 or older than 40. This should not exclude hiring of younger high school graduates who should be considered a necessary group for our training pool and future customer relations personnel, nor should it exclude those over 40 if their training or previous experience qualifies them for customer relations work.

I realize that we seldom secure an employee with all the traits and qualifications mentioned, but unless we reach high we will end up with employees who do an ineffective job and who may, themselves, become problems.

Where Do We Get Them?

I presume that most companies obtain their customer relations employees from within the company, and this is most desirable. Those companies who operate under a union contract usually post job opportunities. Many desirable employees are secured for customer relations work by this medium, but unless the jobs are made attractive, and there is some incentive to encourage the employee to apply, the best prospects will not be attracted for this work. Seniority under job posting often prevents the selection of the most qualified employee for consideration.

Companies who do not operate under a union contract or who do not post job opportunities are in a position to select and transfer interested and desirable employees from other departments.

"Want-ad" advertising is one way to obtain applicants, especially just prior to mid-year or school-end graduation time. The format of "want-ads" should be inviting, arouse interest, and reflect opportunity.

Continual contacts with high schools, business schools, and colleges should be maintained because there is real competition among industries and our industry can meet this competition by telling what it has to offer.

High schools in many sections of the country are offering a plan to permit selected students to work during part of the school day in business. This establishes a tie between the student and the company and often results in permanent employment after graduation. This high school plan should be explored if it is not now available in your community.

Summer employment for both high school and college students is also an effective way to obtain desirable permanent employees.

Present employees should be encouraged to be on the lookout and to suggest good prospective applicants for employment.

Many times applicants will appear seeking employment because they are interested in our business, but the number of direct applicants has seemed to decrease in recent years.

How Do We Select Them?

If employees are selected from within the company consideration should be given to the employee's past job performance. Have they done an acceptable job? Have they been dependable? Is their lost time record satisfactory? Does this employee have a sincere interest in transferring to customer relations work, not a monetary interest only? Appropriate aptitude tests, telephone voice tests, and questions during interviews should be directed and phrased to judge employee's poise.

Direct hiring should consist of two steps. First: a member of the personnel department should interview the applicant and make a personal appraisal. The applicant should be given appropriate aptitude test or tests. Considerable weight should be placed on result of aptitude tests when considering an applicant for employment, as a study made by several companies of the results of aptitude testing indicate that poor marks on tests usually mean poor job performance, average marks or better than average indicate fair or good potential job performance.

Previous job employment references and school records should be checked. Usually those applicants who have been leaders in school activities have desirable traits that can be developed.

Second: The supervisor of the customer relations department should always be given an opportunity to interview the applicant. During the interview the supervisor should try to determine family background, as this information may be of assistance in determining expected job performance. Also, an attempt should be made to determine expected length of employment. The supervisor should then compare impressions of interviews with those of the personnel department, but in all cases the responsibility for selection of the employee should be that of the department manager or supervisor.

How Do We Train Them?

Training customer relations employees is one of our most important responsibilities. Let's not waste good material because of an inadequate and ineffective training program.

We have two classes of employees to train. Those who come direct to the customer relations department from school or another company and those from within the organization. New employees require special attention and should be made to feel at ease. The attitude of the supervisor and older employees the first day, first week, and first month, toward the new employee, will have a direct effect on the new applicant's opinion of the company.

The supervisor should have a complete understanding with the employee as to what is expected of him. He should be informed about any probationary period, if there is one, working hours and compensation, and the privileges and benefits under any company plans or union contracts. Emphasis should be placed on responsibility and dependability. Make it possible for the new employee to get acquainted with as many of the fellow workers as possible.

Soon after employment the employee should be exposed to an indoctrination course covering as broad an outline of the company's operation as is practical. Special instruction should then be given by a competent instructor on policies, rates, telephone techniques (telephone company training instructors are available for this training by request), and the use of forms. The instructor should, in all phases of training, stress the necessity for a proper attitude toward the customer in an effort to develop those all important traits of patience, understanding, and friendliness.

The importance of watching for details should be pointed out and examples of situations resulting from carelessness should be illustrated. It is very important that experienced, competent, and interested older employees be assigned this training. The on-the-job instruction of the new employee should not be considered as a side assignment but one of utmost importance and the instructor should have adequate time to devote to the new employee without having to worry about his own work production.

During the on-the-job training, monitoring of telephone conversations gives the supervisor an opportunity to correct bad habits and to prevent the giving of inaccurate information early in the training program. During the period of special instruction and on-the-job training the supervisor should be close to the new employee showing a direct interest so the employee will feel a sense of belonging to the organization. It is most important that time be provided the new employee to be trained in other related customer departments, such as customer billing, customer service, etc., depending on the expected job assignment and what general information the employee will need. The important thing is to have enough time to train the employee before specific job assignment.

Advantages of Experienced Employees

Employees transferred from within the organization have had the advantage of some experience with the company. However, it is essential that the supervisor review the difference in direct customer relations work with work that is only indirectly related, and the need for stressing the desire for the company to develop good customer relations through the employee and his work.

Special instruction and on-the-job training should be given, depending on the employee's company experience and needs. In order to keep the employee's interest and help his morale, productive work should be assigned as soon as the supervisor feels he is ready.

At this stage of training an appropriate written test covering all phases of customer relations work might be employed to measure the effectiveness of the on-the-job training, to be reasonably sure the employee can handle the job in a satisfactory manner. During the early period after transfer the supervisor should be alert to observe and detect any carryover traits that are objectionable so that correction may be possible before they affect customer relations.

What Indirect Training Is There?

The management has a responsibility to provide rules, regulations, and policies that may be clearly interpreted and properly carried out with latitude for the exercise of good judgment. The department head should have an interest in the employee to the extent of making himself known and occasionally stopping to chat when time permits.

This should be done in a way that the direct lines of responsibility are not affected. The immediate supervisors should always be available for counsel and advice and reflect an attitude of understanding and helpfulness. Older employees should be willing to transmit a spirit of unselfishness in their desire to give help and assistance. One very important way to train is to set a good example. If we expect the employees who work for us to be good customer relations personnel then we also must be good customer relations people.

Periodic Appraisals Urged

Periodic appraisals and examinations should be employed as required by contract or for merit increases. Periodic appraisals give the opportunity to keep close to the employee and review good and bad traits. Examinations provide an opportunity to measure the employee's knowledge of the job.

We should encourage school authorities to impart and instill in students the need for dependability and the acceptance of responsibility in business. If students came to us with these traits the job training would not be so difficult.

Screening, training and use of customer relations personnel is of the utmost importance to all our companies if we expect to have the good will of the public and our customers.*

What we need is a larger pool of employees in training to overcome the necessity of exposing employees to jobs they are not ready for. Some companies may find it desirable and practical to hire part time employees to cover peak periods. Consideration should also be given to hiring mature women, carefully screened and preferably those who have had business experience. Similarly, some operations that are covered by women and are affected by rapid turnover may be filled by men.

There is little doubt that retaining a larger pool of employees in training and the use of men on some jobs now covered by women will add to our costs, but in my opinion we will be able to measure the value received for this additional expenditure by improved customer relations.

What we all want is the most efficient, effective customer relations department manned by employees who will make our customers happy to do business with us.

*Aptitude tests and training programs used by some companies may be helpful to other companies. Listed are some of the companies which have used such tests and programs. They will supply information upon request: Southern California Edison Co., The Washington Water Power Co., Long Island Lighting Co., Houston Lighting & Power Co., Kentucky Utilities Co., Union Electric Co., The Cleveland Electric Illuminating Co., The Cincinnati Gas & Electric Co., New York State Electric & Gas Corp., Niagara Mohawk Power Corp., Central Hudson Gas & Electric Corp., Public Service Co. of Colorado, The Toledo Edison Co., Baltimore Gas and Electric Co., The Detroit Edison Co.—also, Customer Relations training materials prepared by Joint Customer Relations Committee of EEI and AGA, including sound films, employee booklets and instruction manual, from EEI, 750 Third Ave., New York 17, N. Y.

100-Millionth KW of Electric Company Generating Capacity Goes into Operation

A NEW milestone in electricity production has been reached with the 100-millionth kilowatt of investor-owned electric company generating capacity now in operation, EEI has announced.

The nation's electric companies reached 100,000,000 kw of generating capacity on May 11 when Tucson Gas, Electric Light & Power Co. put a new 75,000-kw generator on line in its Tucson, Ariz., Plant Number 4.

A record total of 15¾ million kw of new generating equipment is being installed this year by the electric utilities, both investor-owned and governmental. By far the greater part of the additions are in electric company plants.

Total utility industry generating capacity was 130,356,000 kw as of March 31, about double what it was at the end of 1950.

"Some $4 billion is being spent this year by electric companies for new plant and equipment," J. W. McAfee, president of the Institute, said. "This demonstrates the industry's firm belief in the essential strength of the economy and its continuing growth."

Mr. McAfee pointed out that during the past 10 years electric company construction expenditures averaged about $2½ billion annually, and that in 1957 the total was $3.7 billion. At the end of last year, the companies' investment in electric plant and property was about $36½ billion—almost double the 1950 total.

The installation of new generating facilities in 1958 will exceed the previous high record of 1955 by some 3 million kw, and is about equal to the total net installations of the 10 years between 1936 and 1946, Mr. McAfee said.

BLBS Bureau Comic Book

SHERLOCK Ohms and Dr. Watts, a new comic book for use by utilities in stimulating consumer interest in good home lighting, is available from Better Light Better Sight Bureau, 750 Third Ave., New York, 17, N. Y.

Prepared by BLBS Bureau's Lighting Information Committee, under the chairmanship of W. A. Standard, Consumers Power Corp., the book is priced for mass distribution through such avenues as home shows and fairs, on utility display floors, 4-H clubs, schools, etc.

Training Program Is Held for Leaders of 'American Economic System' Course

THE first training program for electric utility company personnel who will present the EEI "American Economic System" course was held in Chicago, April 21-25.

Sixteen men from 12 firms examined and discussed the material covered in the course and the techniques of conference leadership used in presenting it to employees. Utility companies represented included:

Duke Power Co., Ebasco International Corp., Georgia Power Co., Houston Lighting & Power Co., Indianapolis Power & Light Co., Interstate Power Co., New Orleans Public Service, Inc., Oklahoma Gas and Electric Co., Southern Indiana Gas & Electric Co., Virginia Electric and Power Co.

The daily meetings gave the men an opportunity to discuss common problems in the field of employee communications, and to see how "The American Economic System" program would fit into their companies' plans. A number of companies represented had given the course some years ago, and are planning to give it again because of its importance today and because of the fact that about half of their personnel have been hired since the program was last presented.

The course material, originally conceived by Edwin Vennard and Robb M. Winsborough, has been acquired by EEI for use by member companies. The materials are being offered at production cost.

The materials, which consist of six filmstrips, a 96-page booklet, demonstration kit, and Leader's Manual, were designed to present, clearly and simply, the facts about our free enterprise system, and to show that this system is far superior to any that man has ever seen.

The course includes a dramatic demonstration of the great wealth which Americans have developed for themselves under this system, in sharp contrast to the rest of the world.

Emphasis is placed, too, on the spiritual and human side of our accomplishments: our essential freedom, the guarantees of the Constitution, our successful fights against disease, and our steady improvement of living conditions, housing, and a host of other factors.

Thus it is demonstrated that our system has produced—both in terms of material goods and human welfare—more than man had ever dreamed of, and far more than any other system that has yet been tried. The reasons behind this fact are thoroughly explored. The importance of machines in creating this abundance is stressed, as is the fact that Americans have been free to keep the rewards of their own labor. It is pointed out that contrary to some beliefs, machines actually make jobs, rather than eliminate them. All the material is documented by readily accepted sources of fact, most originating in the U. S. Department of Labor.

Conference Leadership Sessions

The later sessions of the Chicago training program were devoted to the principles of conference leadership. It was pointed out that training for conference leadership is excellent for developing future managers, since an understanding of conference principles enables these men to participate more fully and effectively in all types of meetings, and to keep their thinking and discussion aimed directly at the subject at hand. It also develops their self-confidence and ability to express ideas clearly. Conference leadership is good experience in planning for an end result, and in carrying out the plan. Experience of this kind helps make a good manager.

"The American Economic System" is the first phase of a program designed to give utility employees more information about their industry and how it fits into the economic picture of America. Plans are now underway for a similar set of materials covering American freedom—how we got it and how we can keep it. With an understanding of the American economic system and our history of freedom, employees will then be ready for the next step—the economics of the power business.

Management often assumes that power company employees know all the facts about their industry, it was noted in the group's discussion. Yet Central Surveys' poll shows that fully 40 per cent of electric company employees are misinformed or uninformed on the subject of Preference; 69 per cent are unaware of tax discrimination; and fully 75 per cent haven't heard of recent revenue bond proposals. On the technical side, it was pointed out that many employees don't know the difference between a kilowatt and a kilowatthour, and few have an accurate conception of load factor.

Understanding the nature of capital costs is important to understanding many of the principles of the power business. The new EEI courses, presented in the proper order, are designed to give employees a broader understanding of the industry so that they can discuss it intelligently, with a better comprehension of the reasons for various company policies.

Largely based on the success of the first training session for conference leaders, the Institute is planning a second session, for which interested companies may enroll now. The next training session will be conducted by Mr. Winsborough, vice president, Middle West Service Co., Chicago, who conducted the first session. In addition to being co-author of "The American Economic System," Mr. Winsborough has had long experience in training conference leaders.

The EEI-sponsored program has been receiving increasing interest from member companies. On the basis of present response, it appears that these programs will soon be in widespread use in the industry. Further information about them can be obtained by writing to Prall Culviner at Institute headquarters, 750 Third Ave., New York 17, N. Y.

Wilkes Dies Before House Committee

FRANK M. WILKES, chairman of the board, Southwestern Gas and Electric Co., and a former member of the EEI Board of Directors, died May 29 in Washington, D. C., as this issue of the BULLETIN went to press.

Mr. Wilkes, 69, was testifying before the House Interior Committee which was hearing a bill on the government proposal to revamp hydroelectric power, when he collapsed and died.

A detailed obituary will appear in the June issue of the BULLETIN.

EEI's General Office now occupies the 16th floor (arrow) of building at 750 Third Ave., New York.

J. W. McAfee, Institute President, receives a message from Mrs. Ida Josephson, receptionist, at EEI.

EEI General Office Relocated

AFTER more than 25 years at 420 Lexington Ave., the General Office of EEI has completed its move to 750 Third Ave., New York 17, N. Y., two blocks north and one block east of its former location.

At the Lexington Ave. address, EEI occupied parts of three floors, while in its new quarters all departments and activities are situated on the 16th floor, permitting more economic and efficient administration and greater convenience and services to member companies.

In designing the new office, particular attention was given to provision of excellent meeting and service facilities. These include the large Board Room (21 by 40 feet) which is equipped with a sliding wall panel so that two meetings may be held concurrently when necessary. There are other Committee meeting rooms and a visitors' room as well. Indicating the significant use made of the meeting facilities, in 1957, 134 meetings or conferences were held at the EEI General Office and were attended by nearly 3,000 persons.

In serving EEI member companies

Edwin Vennard, Managing Director and Vice President of the Institute, confers in his office with W. B. Gesell, EEI Director of Economics and Statistics.

A. B. Morgan, EEI Secretary and Assistant Managing Director, dictates correspondence to his secretary, Miss Marjorie Goodson.

Cornell R. Bozek, head of the Records and Accounts department, doublechecks tabulations with assistant, Mrs. June Taubman.

with a wide variety of data and informational matter, the Mail, Reproduction and Shipping section last year reproduced about 3,600,000 sheets of Institute material, collated nearly 3,765,000 sheets, processed some 144,000 pieces of incoming mail and nearly 480,000 pieces of outgoing mail. Approximately 552,000 envelopes were addressed, nearly 15,100 orders were filled and some 120,000 pounds of mail were processed and posted.

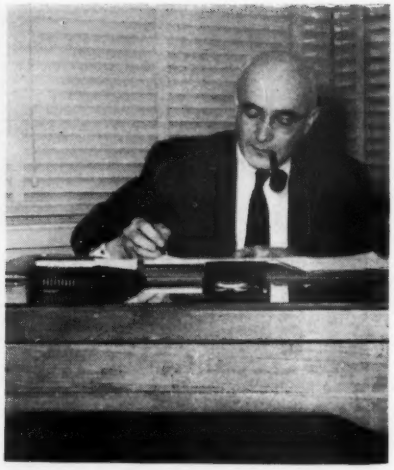
Incoming telephone calls to the Institute, a large percentage of them inquiries, total about 100,000 a year.

The Records and Accounts department annually prepares and mails billings for some 6,000,000 pieces including publications and other materials shipped by the Institute, and is custodian of all dues of member and

James T. Coatsworth, EEI Commercial Director, completes a telephone call in his office at the Institute's new headquarters.

Donald K. Wulterin, Institute graphic artist, receives an assignment from G. W. Hedman to prepare illustrations for an address by an Institute official.

Alfred E. Softy, the Institute's Director of Accounting, confers with his secretary, Miss Dorothy Macdonald.



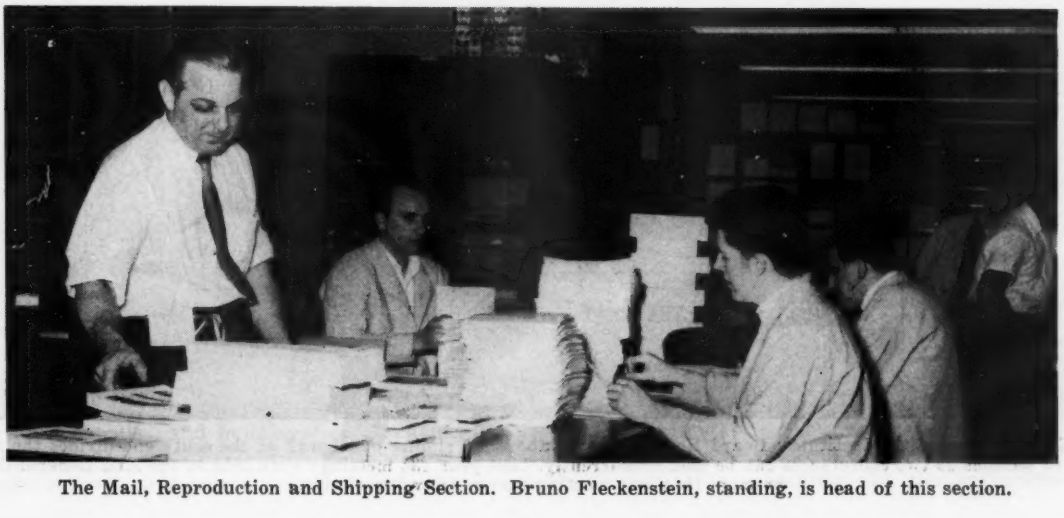
Harry E. Kent, EEI Director of Engineering, studies a report.

affiliate companies. It also must account for all expenditures, including special funds—such as the HOUSEPOWER program.

A vital service not only to the industry but to manufacturers, economists, security analysts, construction people, periodicals, libraries and others is provided by the statistical organization. Statistics on the electric industry, gathered and compiled by this group, are rated as the most accurate, comprehensive and most rapidly processed of any industry. They are widely used in the electric utility industry, as well as in many other fields.

The EEI Library, in addition to extensive historical material on the electric industry, contains perhaps the

The EEI Library is available to staff members and representatives of member companies. Charles A. Larson of the Institute's Economics and Statistics staff is shown.



The Mail, Reproduction and Shipping Section. Bruno Fleckenstein, standing, is head of this section.

Paul Rederer of the Economics and Statistics staff consults a reference book in compiling data which are valuable to the electric utility industry and others.

Miss Norma Beimbrink, head of the General Typing Section, receives instructions from John Hamrick of the Institute's HOUSEPOWER Program.

greatest amount of specialized and general information on the industry, and related fields, in existence. The services of the Library are available and used by personnel of EEI member companies, as well as EEI staff members.

In December, 1955, the EEI Board of Directors appointed a Committee on Quarters for the Institute to survey possible facilities for a new location. The Committee was under the Chairmanship of C. B. Delafield, vice president of Consolidated Edison Co. of New York, Inc., and members included S. R. Knapp, president of The Connecticut Light & Power Co. and D. C. Luce, president of Public Service Electric and Gas Co. After a comprehensive study, the Committee selected the Third Ave. location.

The former General Office occupied about 14,500 square feet of usable space. The new quarters have about 18,000 square feet of space, plus 1600 square feet, utilized for storage.

The North section of the Institute's Board Room is shown above. A sliding panel wall at the south end divides the room into two sections so two conferences can be held concurrently. Last year 134 meetings were held in the EEI General Office, or more than one meeting for every two work days.

Why We Chose Electric Heat

By Hugo E. Beck

Superintendent, Bayless School District, St. Louis, Mo.

An address before the 24th Annual EEI Sales Conference, Chicago, Ill., March 25, 1957

TRYING to trace the thinking process one uses in arriving at a decision is often a highly interesting—albiet a rather arduous—task. One is often apt to come up with highly profound and rationalized reasons for relatively simple events.

At a risk of oversimplifying our choice in this instance, there is only one major criterion for anything and everything we do in educational circles; viz., "Does this action *aid* or does it *impede* the learning process of children?"

That is the yardstick of measure briefly stated. Neither money, convenience, utility, pressure, nor availability disrupts this basic premise although these factors do enter into the picture. We chose electric heat because we felt it provided a better physical environment in which the learning process could take place.

Dilemma of Education

The basic dilemma in education today is that the American people are demanding more and better education but within the framework of a relatively fixed and stable income for education. It is an axiom in a democratic society that people will pay taxes and contribute support in direct proportion to the value and worth which they place on a project. To secure more financial support, therefore, the quality of education must be furthered and the status and prestige of teachers must be raised. This is taking place today, but it is a relatively slow process.

Expenditures Readjustment Needed

In the meantime, a basic readjustment must occur in the reapportionment of our expenditures in education. A child coming to school to learn encounters teachers, instructional supplies, and building and in that order of importance. Teachers, instructional supplies, and buildings! To secure further quality in education, more support must be redirected for teachers and for instructional supplies. Consequently, less can be channeled to the construction and operation of the physical plant.

This places a tremendous responsibility on designers, engineers, and architects to develop more economical, yet more perfect physical facilities so that teachers, who have a difficult task to perform under the best of circumstances, will never be hindered by poor design, faulty construction, too much heat, too little light, too sparse ventilation. This much is your responsibility! This is where you make your greatest contribution to enable children to learn.

Electric heat has enabled us to make this financial readjustment. Savings effected in initial outlay are available now in the other areas of teachers and supplies. In our instance this savings could be utilized in a variety of ways:

1. It is equivalent to adding at least three more teachers on our staff for a year.
2. It is sufficient to install a closed circuit television station, a public address system, and a whole battery of motion picture projectors, opaque slide projectors and enough other materials to equip our entire high school with modern audio-visual equipment.
3. Or, it could equip our entire home economics and industrial arts areas.

So much for initial outlay. There are other compelling reasons for our choice in this instance. To fully understand these reasons, I again must assume my role as a teacher and point out certain basic future trends in our educational pattern which have a direct bearing on this matter of electric heating.

Two trends are readily identified:

1. The trend toward the extended school year.
2. The trend toward a more fundamental use of visual material, as television, filmstrips, films, and opaque projection.

At a recent convention of the American Association of School Administrators in St. Louis, one of the basic resolutions adopted was favoring an extended school year. This is the first time that official sanction was placed upon this form of educational organization. An extended school year does not mean doing over 12 months the same things we do now in nine. It is not more of the same but rather a definite reemphasis and redirection and it has interesting implications for electrical heating.

In our own Bayless District we are now in the process of developing our program for the second year. To achieve an extended year, one half of our staff is on a permanent 12-month basis. During the summer months, we concentrate on three basic areas: Enrichment, Recreation, and Remedial Subjects.

Summer Courses

On the elementary level last year we offered our children courses in French language and culture, science activities, creative dramatics, and fine arts. In high school we ran a science seminar, taught driver education, and typing.

In the recreation area, we set up a summer camp program teaching swimming, crafts, dancing, hobbies, and recreation.

In remedial subjects, we offered special help in reading and arithmetic on the elementary level and taught basic courses in high school.

Most of these classes ran only in the morning and afternoons were devoted to group faculty planning and creative thinking for the coming school year.

Classes Well Received

Not only was this well received in the community but there is considerable interest in expanding this program.

Now, add to that our further plans of gradually operating our educational facilities in the early evening for

music classes, industrial arts, home economics, and fine arts classes and you will see that our educational plant will be operating 12 hours a day, five days a week, 12 months a year. This is our approach to secure more quality in education.

When you begin operating on a 12-month schedule, the *comfort* factor becomes all-important. A relatively constant year-round temperature is desirable—heat in winter, cooling in summer, both in spring and fall, sometimes on the same day and within the same hour.

How to insure relative comfort becomes now a matter of economics. On an ascending cost scale, we would:

1. Insulate only.
2. Install electric heat. You automatically have sufficient electric power for future air conditioning units.
3. Install combination heating and air conditioning units—heat pumps or similar devices.

In our own instance, our funds were not sufficient to completely air condition our new building; impossible to air condition the remaining buildings. Therefore, our first step was to insulate and take advantage of a little natural cooling and heating. Second, we choose electric heating. We are now equipped with sufficient "school power" to install air conditioning in those areas where they are needed and, believe me, they will be needed this summer and in the summers to come.

Trend to Audio-Visual Aids

Another major trend of importance is that toward a more adequate use of audio-visual aids. The way modern schools are constructed it is not only almost impractical but well nigh impossible to use any audio-visual equipment. How are buildings generally built?

First, you surround the room with glass, then buy venetian blinds for partial control, and finally buy blackout drapes for complete control. Even then it never ever becomes dark enough. Your custodian could spend one hour cleaning windows, one hour cleaning blinds (and a nastier job there is nowhere to be found) and another hour locking windows. One room seems insignificant but have a 24 classroom building and a one man detail spends time just making sure all windows are closed and locked.

To secure more quality in education, a tremendous upsurge, therefore, in the use of visual aids must be utilized. Classrooms must be engineered and constructed for educational purposes first—not ease of design, beauty, or any other facet of the drawing board.

Electric heat was designed to fit such a trend. Turned about, design a room to fully utilize visual aids and you have at one and the same time designed the conditions prerequisite for electric heating.

Windowless Classrooms

For years I have been imaginatively designing classrooms born for teaching. I wanted a completely windowless, spacious room. Without windows, we would have perfect control of lighting at all times. Introduce one square foot of window space and you have uneven lighting—too much or too little or too much glare every day of the year. Without windows, heating, cooling, and ventilation would *have to be* provided for—extensively and evenly—not left to chance as is the case now. In describing this ideal room one time to an electric utility employee, he threw in the idea of electric heat and from there the germ spread. He saw an opportunity, seized it, and possibly started a trend in our area.

A glance at our finished architectural plans reveals that we do have windows—very few and very small—but nonetheless windows. The board and faculty feared psychological repercussions of claustrophobia from students. Their worry was needless however; the local building code vetoed the whole idea anyway. We tried to compromise for a 12" window strip five feet over floor level but they were not in a compromising mood. Put in windows for light and ventilation was the verdict. You may then cover them up and never open them but they have to be there.

These building codes do not have the moral authority of the Sermon on the Mount—they can be changed. When they are, possibly we can begin to use satisfactorily the tremendous wealth of audio-visual material now gathering dust. Educational television, closed circuit telecasting will then come into its own.

When that day comes and we recuperate from our mania for glass with resulting glare and high heat penetration factors and high heat loss qualities, we'll have a room not only designed for electric heating but also one for utilizing modern audio-visual techniques.

Fire, like water, wind, and the other elements are basic and essential to man but they can also destroy him in short order if they are not controlled. There are more days in a year when the temperature in a classroom is too high rather than not high enough. It's either a problem of maintaining a comfortable temperature or else of cooling.

Teaching is difficult enough, as I have said, under the best of conditions without inducing slumber, lethargy, sloth, and torpor through the tranquilizing effects of too much heat. In bitter cold days, our conventional system works fine. If we have troubles, it's not overheating. But there are thousands of areas in this country of ours—and St. Louis is one of them—where if you don't like the weather, wait a few minutes. It will change. In February over a 48-hour period, temperatures ranged from —5° to 67°.

When the temperature in a given day has a differential of 25°-30° we are in trouble. Some classes are too cold, but most are too warm—even with individual room thermostats and unit ventilators. On such days we control heat in the classrooms—after it gets too hot—by shutting off the boilers manually.

Chooses Electric Heat

I do not know all the reasons why a room still gets hot unless the boilers are shut down. Engineers have tried to explain this to me by saying it's impossible. "It is not caused by the boiler. All valves are shut by the thermostat," they say. I don't know. All I know is that I will take my chances on electric heat for instantaneous cut-off when the thermostat calls for it. At the touch of a switch, the heat may return. At another touch it will go off, stay off, and not keep heating pipes the length of the entire room.

These, then, are the basic educational considerations. Naturally, there are other facets. For the sake of a total picture, I would like to briefly recount them for any decision is never the result of one set of values. These reasons may not apply to all schools

but they did affect our thinking at Bayless.

1. *Safety.* No type of energy is 100 per cent safe. The human factor is always present. Our only task is to eliminate as many variables as possible to keep accidents down. Non-explosive, non-combustibility were two elements in electricity's favor. Two years ago we had one explosion with a gas-oil combination boiler. No fatalities but we're not anxious for another. No low water cut-offs to worry about, no leaks, no rust, no pipe coverings. Safe operation—we think we'll have!

2. *Simplicity.* The simplicity of a shovel, a strong back, a boiler, and a ton of coal is gone forever. In our new elementary school we now have two low pressure packaged boiler units in series generating steam by gas and/or oil depending on outside temperature. It took us two years to get both boilers in operation over a 24 hour period, i.e. without a shut-down. We want to pay teachers—not combustion engineers. Our custodians will not be confronted by complex mechanisms with electric heating. They can concentrate on cleanliness.

3. *Dependability.* Third, we believe that electricity as a source of energy outstrips any other source in dependability. Presently, when in winter, the heat goes off and the boiler is shut down, school is out. We dismiss the children. This may be due to one of various reasons or combination, as:

a. Electric power failure or strike in that industry.

b. Failure of the boiler—whether it be flues or other mechanical dificulty.

c. A strike in the gas industry or prolonged cold spell when gas is diverted to residential use.

d. A strike in the oil industry or inability to deliver because of weather conditions, as snow or icy roads.

With electric heat, we eliminate all trouble sources listed above except power failure and here we haven't lost everything. Under present conditions, we're shut down anyway without electricity for we must have power to operate motors for conventional fired boilers.

Pick a cold February morning when the temperature hovers at zero, have a boiler failure at 5 o'clock on a Monday morning after a temperature set-back weekend, be unable to contact a repairman immediately; when he arrives, have him tell you it may be one hour or eight before heat is resumed, have 800 cold children arriving by bus in a few minutes. That's the time to see the superintendent. If he doesn't order electric heat forthwith and with dispatch, well, perhaps you'd better shake up your sales department. One day's emergency shut-down and dismissal can cost us more in salaries than the difference between electric and gas operational cost for one year.

4. *Versatility.* At home I have a hand power saw. Not only does this cut and rip lumber but with various attachments, I drill holes, buff furniture, sand, and try out myriad other skills the advertisement said I could. When I want to saw, however, the drill is attached; when I want to drill, the buffer is attached.

The advertisement said that with this device I would have a well-equipped tool set. I have! I also have the dubious distinction of being able to do a dozen things poorly. This epitomizes my reaction to combination fuel sources. In our area when the temperature dips below 25°, electronic devices shift our fuel source from gas to oil. This always occurs again on frigid days extremely early in the morning. Something always seems to occur when this changeover takes place and we come to school to be met with shut down boilers, cold children, and hot tempers. We've solved this problem temporarily by putting on a custodian throughout the night, one of his main duties being to check the operation of the boilers. This we do not anticipate with electric heat.

5. *Operation costs.* We know that the operation of our plant heating system will be higher. We figure we can amortize our operating cost in relation to initial outlay savings in 12 years — provided — that the cost of fuels remain constant proportionally.

Faith in Electric Industry

From studying past trends and future possibilities, we were convinced —independently of utility statements —that for the future, we would more safely rely upon electric costs remaining constant or going down as they have in the past. This, however, is an area where we must rely upon your ingenuity and your public service. We trust that the present experimentation in the atomic energy field and the Shippingsport Plant will hold the clue to future expansion in the electrical field.

These, then, are some tangible, concrete reasons. But I would be amiss if I neglected to delineate some intangible factors which applied in our case and which played an important role in our calculations.

First was the integrity of those with whom we dealt at the local utility. Since this was the first installation in this area, they were as anxious as we were to get a relatively objective appraisal. No fantastic claims, no pressure, no cajolery, no nonsense, no gifts, no bribes, no price cuts, just an intelligent approach to a complex problem. This we appreciated.

They did promise two things: 1. To furnish us with as much technical and practical data before, during, and after construction as humanly possible; 2. To show us electrical unit ventilators in operation and the opportunity to discuss the problem with those who might have answers.

I have never dealt with finer, more cooperative people. Lest you think I am too easily pleased, you may check with the complaint department of Union Electric. There they know me, not as superintendent of the Bayless system, but a customer of 1143 Vinetta Drive who has been known to register a complaint and a difference of opinion when the occasion rose and it has risen.

After our experience the past several months, we still believe that people sell more products than products do.

Secondly, the day after our decision was reached to utilize electric heat, a critic came to us with the profound observation that since one member of six on our board of education worked for the electric utility this was the answer.

Now I should like to encourage each one of you to take a more active interest in school affairs. But if for one second you think that this situation helped the electric industry, I am sorry to disillusion you quickly. In these days of public scrutiny and congressional investigations of all public areas, the decision will be made in spite of you, not because of you. We not only had to be sure—we had to

(*Continued on page* 152)

Insurance Committee Meeting

Donald E. Williams, *Chairman*

THE EEI Insurance Committee held its semiannual meeting at the Statler-Hilton Hotel in Dallas, Texas, March 12-13.

Visitors at the meeting, in addition to the members, included: R. M. Beckwith, manager, Inter-Regional Insurance Conference; Ellis Clarkson, chairman, Utilities Committee, Inter-Regional Insurance Conference; Sidney Briggs, manager, Inspection and Engineering Bureau for the State of Texas; Charles E. Watson, executive assistant Dallas Power and Light Co.; F. M. Keyes, personnel director, Dallas Power and Light Co.

Nuclear Projects Insurance

Although progress in the area of insurance on nuclear projects has been slow, it has been constructive and is an item of considerable importance to this committee. A. G. Jillette, chairman of the Subcommittee on Nuclear Projects, brought the committee up to date on the present status of developments for various types of coverage in this area. Some problems still remain to be worked out, but it appears that the combined efforts of the domestic insurance market, together with government indemnification, will eventually produce a solution to these problems.

Committee representatives from The Detroit Edison Co., Commonwealth Edison Co., and Pacific Gas and Electric Co. reported on the current status of the nuclear power projects with which their companies are closely associated.

Fire Protection Task Force

Because of the relationship which fire protection has to insurance coverage and insurance rates, the committee has established a Task Force on Fire Protection and Prevention. This group is responsible to the chairman of the Fire Protection Subcommittee, R. R. MacKay, Jr., of the Philadelphia Electric Co. The task force is currently working on suggested industry practices in the area of generating stations, substations, nuclear power plants, and other utility properties.

W. O. Randlett, chairman of the Subcommittee on Rating and Forms, reported that discussion was continuing with the Inter-Regional Insurance Conference regarding the electrical apparatus clause, deductible fire insurance coverage, and other related areas. He expects that further discussions will be held with the representatives from the Inter-Regional Insurance Conference in an effort to resolve a number of problems which exist in the area of rating and forms.

Mr. Beckwith, a guest at the meeting, also commented on the work currently in progress between the Inter-Regional Insurance Conference and the EEI Insurance Committee.

Mr. Clarkson assured the EEI Insurance Committee members of his group's desire to cooperate to the fullest extent possible in an effort to resolve these problems to our mutual satisfaction.

Interest in changing the deductible for fire and allied lines has increased considerably in the last several years. M. A. Tait, chairman of this Subcommittee, reported on the present status of this type of coverage, and also the interest which some insurance companies have shown in this particular area. It is expected that efforts of this Subcommittee will be coupled with the Rating and Forms Subcommittee in an effort to develop an interest on the part of all insurance companies to write this type of coverage.

C. H. Nelson, chairman of the Subcommittee on Boiler & Machinery Insurance, reported on a meeting which his subcommittee held with representatives of the National Bureau of Casualty Underwriters. Among the items discussed at this meeting were coverage of separately located exciters, the definition of accident, and limits per accident. The National Bureau of Casualty Underwriters agreed to take under consideration these and other items which were discussed and at an appropriate time have another meeting with the subcommittee to discuss what action might be taken.

The excess liability insurance market has been in a somewhat static state for a considerable period of time. J. L. Kennedy, in making his report for the Subcommittee on Excess Liability Insurance, pointed out the effects which the nuclear incident exclusion endorsements will have on public liability policies.

For several years A. L. Benjamin has been chairman of a subcommittee investigating extra expense insurance. It now appears that the interest in this area is rather negligible, and the Subcommittee has, therefore, been abolished. Should new developments or new interest in this area arise in the future, a new subcommitee may be appointed.

Employee Benefits Coverage

Because many of the members of the Insurance Committee are responsible for the purchase of employee benefits types of coverage, a general discussion was held to determine whether a subcommittee in this area should be established. It was generally agreed that such a subcommittee would serve a very useful purpose. However, it was pointed out that the activity of this subcommittee should in no way conflict with or duplicate activity on employee benefits which might be conducted by the Industrial Relations Committee of EEI. The chairman was requested to clear this matter with the chairman of the Industrial Relations Committee and to be prepared to appoint such a subcommittee for the Institute year, 1958-1959.

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Controlling Small Purchases

By F. M. Reinhold

Vice President, The Connecticut Light & Power Co.

An address before the EEI Purchasing and Stores Annual Meeting, Minneapolis, Minn., April 28, 1958

THE words "controlling" and "reduction in cost" should be kept in mind throughout this report, and these questions should be asked:

1. How much "control" do I actually have over small purchases?
2. Should cost of administration be reduced or increased to result in greater overall savings?

The committee has gathered from its members and others, data regarding procedures now followed by many companies involving small purchases. Of the data obtained no two procedures are alike; there exists a wide range of systems and many who replied frankly admitted their methods left much to be desired. There must, of course, be variations to fit differing size and type companies—those in large urban territories with close concentration have a vastly different problem from companies with widely scattered small operations. However, the need for *control* is no less important regardless of size or type of operation.

Basic Ideas Presented

Therefore, no attempt to suggest a system which may be used universally will be made. Certain basic ideas, suggestions and perhaps a critique of existing procedures in an effort to stir imaginations or to create a desire to do our jobs a little bit better, will be presented.

Most companies operate with:

1. Local orders for small purchases.
2. Blanket orders for small purchases.
3. Emergency orders for small purchases.
4. Pickup orders for small purchases.
5. In some instances, petty cash.

The petty cash arrangement appears to be the most unpopular and apparently is not used extensively.

In a great number of companies, the preparation of the local order and the actual picking up of materials is done by service people, engineers, construction foremen and others, who have no direct connection with, and little knowledge of the purchasing function, and over whom the purchasing agent has little, if any, control. The purchasing agent in such cases usually accepts what comes to him in the way of billing or functions after the act has been committed.

Problem of Control

Since the problem of control centers largely around the person in the field operation, who should work in close cooperation with the purchasing department, it would appear highly desirable that such person be directly connected with the purchasing department.

How many purchasing agents know the annual dollar volume of small purchases of his company? — the total may surprise many. In the case of my company, it amounts to just short of $1 million out of a total of approximately $35 million purchases, excluding fuel, or about 3 per cent. Therefore, if small purchases are handled loosely, to the extent of 10 per cent, it represents many lost dollars. Our job is to see that these dollars are expended just as carefully as those representing large purchases over which we have complete control.

Suggested Procedure

It is believed that proper and more complete use of storekeepers can be of great value in the administration and control of small purchases. Many companies have a storekeeper in each district or plant operation who looks after the material requirement of the area. He should be affiliated with the purchasing department — usually under the supervision of a general storekeeper, who acts as liaison between the purchasing department and the field.

Blanket or local purchase orders should be used by the local storekeeper when conditions require. The purchasing department should predetermine the best local sources of materials for use in a given area, negotiate yearly or more often if necessary, with the vendors regarding prices and discounts offered, and then if satisfactory, issue blanket orders for the year on such vendors for use by the local storekeeper in obtaining small quantities of materials required. A monetary limitation (many companies use $50) should be placed on such blanket orders, and such orders should specify the type of materials covered. Invoices covering materials thus obtained to be checked by the purchasing department.

Under emergency conditions where no blanekt or local order exists, the local storekeeper should be given authority to issue emergency orders for material, later forwarding confirming requisition to the purchasing department for review.

With such a plan, the storekeeper becomes an extension of the purchasing department in the field, and the cycle of control would appear to be complete.

Arguments for Plan

Arguments favoring such a plan include:

1. A single person is responsible in each district or plant for material pickups; no wide delegation of authority.
2. That person is trained to know materials, sources of supply and to reflect the viewpoint of the purchasing agent in his actions.
3. Turnover or transfer of stores personnel is generally very low when compared with engineers, construction people and others.
4. Others in district and plant organizations, as well as floating construction crews, should prefer such a plan since it leaves them free to carry on their own jobs.
5. The purchasing agent should favor it because of the lack of confusion in handling invoices or of having to spend time straighten-

ing out situations brought about by persons unfamiliar with procurement.

We believe that dollars spent for small purchases (in the aggregate there are many) can be as well controlled as those dollars spent by a central purchasing operation. The storekeeper in the field appears to be the answer. Obviously, he must be well trained and supervised, and recognized as the right arm of the purchasing department. This makes it possible for purchasing to extend its scope into all areas of material requirement and use. Such a plan can also do a great deal to improve communications with the field—an area in which many purchasing people have left much to be desired.

Areas of Cost Reduction

A substantial reduction in the quantity of materials picked up on local blanket orders can be accomplished, probably with cost savings.

Some examples are:

1. Extensive standardization to which purchasing can make large and valuable contributions, can result in less pickups of odds and ends locally, and also place on purchasing the added responsibility for checking local pickups to insure that standards are not violated—another area in which the storekeeper can assist.
2. Check of items involved in small purchases locally may show that while each district requirement may be small, in the aggregate, the requirement could be considerable. Savings may be made by central stocking.

Our subject ties in closely with purchasing policies, work procedure manuals and standardization on which all of us have, or will be, spending more and more time. Closer control of small purchases becomes a "must" and I venture to say that one of the areas most in need of attention, and where some of the greatest savings can be made, are here.

Now let's do some soul searching.

1. Does purchasing have *control* of small purchases in your company? It can be accomplished.
2. Do you know that lowest prices are obtained on small purchases? It can be done.
3. Do you know that materials picked up locally are not already in local storerooms? It happens.
4. Does the field make full use of purchasing know-how? It can be done through your local storekeeper.

Obviously, with the rapid growth of our industry and frequent changes in materials, any system we devise must be checked and revamped at regular intervals to keep abreast of company requirements—always with control and costs in mind.

Why We Chose Electric Heat

(*Continued from page* 149)

be positive that this was the correct and proper decision to make.

These then are our reasons—the stuff from which our decisions came. We think they are sound reasons—we think they are valid.

The Other Side

It might be interesting to note a few of the reasons why we almost did not choose electric heat.

1. The fairly extravagant claims in the electric heat literature of initial savings up to 40 per cent. Another article stated that since eight schools had adopted electric heat in a given area, this was no longer in the experimental stage but an accepted fact. These claims were probably the result of an overenthusiastic advertising man; not, I'm afraid, the calculated reflection of a mature judgment.
2. The lack of the electrical utility's use of its own product and hesitancy to experiment with the latest electrical developments.
3. The lack of the local dealer's knowledge and zeal in furthering the product. In our instance, I'm afraid we bought our particular unit in spite of not because of the local dealer, although this sounds much simpler than it was in actuality.
4. The extreme shyness of consulting engineers to study, compare, contrast, and recommend competing energy sources. In all fairness, I must admit that our heating engineer did draw up, at his own expense, a dual set of specifications but we feel that we pulled too hard at the job.
5. When you return home, run a survey of your own employees—meter readers, line men, distribution engineers, accountants, or any not directly connected with selling electric heating and get their reaction to electrical heat. Chances are that it will correlate to a high degree with the average person in that the reply will be "It's too expensive to operate." This is your problem to solve. It will not be easy nor will it be insolvable.

Over the past few months I have talked to hundreds of our taxpayers and citizens in regard to electric heat. Only two have I not convinced; a sales engineer for the competing utility and a steamfitter. These men are not readily convinced.

Reserve Award Won by Southwestern G and E

THE Department of Defense Reserve Award for "outstanding cooperation with reservists and reserve activities," was presented to the Southwestern Gas and Electric Co. at Shreveport, La., during the company's Management Conference which took place recently.

Maj. Gen. T. B. Herndon, mobilization deputy commander of the 14th Air Force, presented the certificate and pennant to J. Robert Welsh, Southwestern president. In making the award, Gen. Herndon said aviation in Louisiana represented a multimillion dollar operation and that the Air Force depended upon reservists to man these operations.

"Without the complete support of Southwestern Gas and Electric Co., and other business firms, we could not maintain such an investment in the state," the general said. "I commend you on behalf of the Department of Defense," Gen. Herndon told the president of Southwestern.

How We Selected and Trained System Operators

By R. N. Youtz

Chief System Operator, Connecticut Valley Power Exchange

An address before the EEI Electrical System and Equipment Committee Meeting, Minneapolis, Minn., May 13, 1958

At the time when the Connecticut Valley Power Exchange came into being, the electric light and power industry was rapidly developing from a large number of small, independent and isolated units into a much smaller number of larger interconnected groups. This was brought about by the great opportunity for savings and better service by interconnecting and financially integrating the small units into larger units, thus making possible the construction of larger stations, to make more effective use of the more efficient equipment and of hydro and to reduce the margin of reserves necessary to furnish adequate service. The popular way of accomplishing this objective was by means of a holding company.

Ferguson Foresees Economies

In 1924, the late Samuel Ferguson, president of The Hartford Electric Light Co., decided that these same economies could be obtained by voluntary cooperation of independent companies.

The matter was discussed with The Turners Falls Power and Electric Co. and United Electric Light Co., both of Massachusetts. A transmission line was built to interconnect the Massachusetts and Connecticut companies and the Connecticut Valley Power Exchange was organized on March 1, 1925, to handle the interchange.

The Connecticut Valley Power Exchange was then and is today an unincorporated, voluntary organization. Membership is entirely voluntary and is subject to termination at any time at the discretion of the member. The member companies have been and still are financially independent units.

This flexibility allowed for a change in Connecticut Valley Power Exchange member companies on five occasions since its founding. Since 1951, the membership has consisted of .The Connecticut Power Co. and The Hartford Electric Light Co. jointly, New England Power Co. and Western Massachusetts Electric Co. The Connecticut Power Co. was merged with and into The Hartford Electric Light Co. on Jan. 1, 1958. Since the planning described herein took place prior to this date, the above membership is used herein.

Until recently the functions of the Connecticut Valley Power Exchange consisted of coordinating the power transfers of its member companies for maximum economy and the accounting required to determine the resultant savings.

In 1955, the installation of new generating units and the attendant greater importance of station loadings and power transfers caused The Connecticut Power Co., The Hartford Electric Light Co. and Western Massachusetts Electric Co. to study their dispatching arrangements individually and collectively to determine the best over-all method of dispatching under present and anticipated conditions.

As a result of this study, a decision was made to expand the functions, authority and responsibilities of the Connecticut Valley Power Exchange to include directing the operations of the generating and transmission facilities of these three companies, comprised of eight steam stations, 10 hydro stations and 575 miles of 69-kv and 115-kv transmission lines and associated substations. The peak load of this system is 580 mw. To carry out this additional assignment a new Connecticut Valley Power Exchange System Operating Center was built, equipped and staffed.

Planning for Expansion

Planning for the expansion consisted of three phases: physical facilities, uniform operating practices and selection and training of dispatching personnel. These are discussed separately below but work on all three phases of the project proceeded simultaneously.

Physical Facilities:

1. Building

Two sites were considered, one near a proposed substation in southern Massachusetts and one near a substation about to be constructed in Connecticut about 12 miles north of Hartford. Both sites are close to the Connecticut Valley Power Exchange load center. Since the latter site was to be developed first, this location was selected. A modern functional design, of one story brick construction containing 5,760 square feet on the ground floor with a full basement was chosen. The System Operating Room was allocated 2,160 square feet with the remainder assigned to general offices and service facilities. The basement area is used for heating and air conditioning equipment, building services, repairs and storage.

One of the particular features of the building is the comfortable lighting in the System Operating Room which supplies 230 footcandles on the desks and 92 footcandles average vertical illumination on the System Diagram Board. The variation from top to bottom of this board is 3 per cent.

2. Communications

The communications problem was especially difficult. A high degree of reliability was required with backup channels necessary for important generating stations and substations. The Connecticut Power Co. was using a leased land wire intercom system for its operating messages. The Hartford Electric Light Co. was using conventional land wires and Western Massachusetts Electric Co. used power line carrier.

In addition, all three companies utilized space radio. Since numerous new channels for telemetering and load control were to be added, a committee investigated the merits of land lines, power line carrier and space radio including microwave.

While reliability was a major requirement, economics were also to be considered in their usual place of importance. A completely new communications system for Connecticut Valley Power Exchange use superimposed on the existing system could not be justified. Therefore, the existing systems were utilized with some additional equipment to be installed so that Connecticut Valley Power Exchange would have three forms of communication to major operating locations, two forms to operating locations of medium importance and one form with radio backup as required to all others.

Use of 508A type PBX equipment on the System Operator desks permits the conventional land wire, intercom land wire, two power line carrier channels, the space radio of each of the three participating companies and the Utility Emergency Radio Network radio to be terminated in one turret at each desk equipped with one handset.

3. Telemetering

Telemetering is provided to furnish the System Operator with the metering necessary to operate the system. Minneapolis-Honeywell Electronik recorders are used to graph the generation of the five major stations, seven interconnections and system frequency. These are combined to obtain the net to neighboring utilities, net interchange, system load and area requirement. Two methods of telemeter transmission are used: (1) GE Co. type TB torque balance telemeter transmitting at the remote location connected to Connecticut Valley Power Exchange by leased land wires and (2), for the more remote locations, GE Co. type TF frequency type telemeter transmitters connected to Connecticut Valley Power Exchange by power line carrier.

4. Automatic Tie Line Control

The form of automatic tie line control selected for the Connecticut Valley Power Exchange System is manufactured by GE Co. The master area controls and dispatching controls are located on the System Operator's desk. The electronic circuitry is rack mounted in the basement. This equipment provides for automatic regulation of tie lines with tie line bias, programming of changes in tie line loading, time error correction and manual insertion of penalty factors for transmission losses. The equipment in the stations provides for automatically loading the generators under control in the most economical manner. At present, 348 mw of capacity is under automatic control. This will be increased to 530 mw this year.

5. System Diagram Board

The System Diagram Board is 68 feet long and 11 feet high. The radius is 25 feet. Perforated aluminum sheets painted load-dispatcher's green are used for the surface of the one line diagram. The diagram is formed of colored tapes. Plastic plugs are used to indicate the position of switches.

Uniform Operating Practices:

Some uniformity of operating practices was recognized as a prerequisite to Connecticut Valley Power Exchange dispatching the generation and transmission facilities of the three participating Companies.

A genuine spirit of compromise provided the climate for achieving this goal. A committee composed of one operating representative and one safety representative from each of the three companies and a representative of the Connecticut Valley Power Exchange prepared a set of uniform switching and tagging procedures for use on the generation and transmission systems.

These procedures were devised to be compatible with the procedures used on the subtransmission and distribution systems.

Connecticut Valley Power Exchange representatives prepared operating instructions for each line, substation and generating station. These covered a sufficient uniformity of approach to operating policies and procedures to enable the Connecticut Valley Power Exchange System Operators to direct the operations of the generation and transmission facilities of the three participating Companies. The operating instructions were circulated in the companies for suggestions, comments and, after final revisions, approval.

Two of the companies used different mobile radio message code numbers and the third did not use such numbers. By committee action, all three companies agreed on the use of code numbers recommended by the Operating Practices Committee of the National Committee for Utility Radio.

Selection and Training of System Operators:

In the foregoing, we have briefly discussed the physical facilities or tools and operating practices or policies necessary at Connecticut Valley Power Exchange to carry out its expansion. These are complex and important but they are not nearly as complex and important as the man who must use the tools and carry out the operating policies.

In this instance the problem was especially difficult because there were no shift operating men available who were familiar with the operation of all of The Connecticut Power Co., The Hartford Electric Light Co., Western Massachusetts Electric Co. and the Connecticut Valley Power Exchange. At best there were only a few men who were familiar with the operation of two of these four organizations. Because of this, considerable study and work was devoted to the problem of selecting and training System Operators.

In order to have a benchmark for this work, job descriptions were prepared for the System Operator position responsible for loading and for the System Operator position responsible for switching. This provided a general base from which to work in deciding what type of men were needed and the direction to proceed in training the men to fill the job description.

1. Recruiting

In order to have as wide a selection of men as possible, recruiting of qualified men was carried out in the three participating companies and the Connecticut Valley Power Exchange. This was accomplished by means of a notice which was posted in these four organizations. The notice stated the education and experience requirements and advised that applicants would be ex-

amined to determine their physical and emotional fitness for the work. Twenty-five applications were received.

2. Selecting

The task of selecting men for training was the most difficult problem in this program. To solve this problem, it was necessary for management to:

a. Select competent men.
b. Select men who could work together.
c. Select men who could be trained for the job.
d. Carry out the procedure with a high degree of objective fairness so that those not selected would continue to function efficiently as part of the overall operating team.

Desires of Applicant

In studying management's role in the selection procedure, it is necessary to consider the desires of the applicant. The more important of these are:

a. Work he likes.
b. Work he can do.
c. A suitable line of progression.
d. A fair selection procedure.
e. Compatible fellow workers.

The selection problem was especially difficult because many of the applicants were unknown to the men making the selections. In view of these requirements and difficulties a selection procedure was setup as follows:

a. Study of applicant's comprehensive application for the position.
b. Study of past record.
c. Discussion with present and former supervisors.
d. Separate interviews by two men.
e. Medical examination with emphasis on good general health, sight, hearing and absence of color blindness.
f. Aptitude tests and interview by an outside organization.

This procedure pointed out the men best qualified to fill the job descriptions. It provided physically fit men and, in addition, provided the checks and balances of all the supervisors thinking with respect to each other and with respect to the aptitude test reports which were necessary to insure objective fairness for each applicant.

Steps a, b, c, d, and e, above, were used as a screen to determine an applicant's suitability for aptitude testing. Several of the men voluntarily withdrew their applications during the screening process. The applicants had been advised beforehand that seniority would be considered only if all other factors appeared to be equal. However, it was not necessary to apply this principle. All of the tools described in a through f, above, were used to select 10 of the remaining 20 men for continued progress in the program. Eight men were needed to fill System Operator positions. The two additional men were provided as insurance against losses and for future System Operator work.

3. Training

The training program was designed to meet a number of fixed conditions:

a. Connecticut Valley Power Exchange's station and interconnection loading responsibilities had to be carried out during the training program. Five shift men were required to carry out this responsibility.
b. The program had to train men to fill a non-existent position.
c. The training program had to be completed in a relatively short, fixed time.

Five of Ten

Of the 10 shift operating men selected to enter the training program, five were Connecticut Valley Power Exchange men presently carrying out the loading responsibility. One man was a Load Dispatcher and four were Station Operators of the participating companies. The first step was to transfer the latter five men to Connecticut Valley Power Exchange. By use of intensive on-the-job training methods, these men were prepared to carry out the station and interconnection loading responsibilities. Completion of this phase of the program provided ten men qualified to carry out this assignment. These 10 men were divided into two groups of five.

The men assigned to each group were carefully selected so that each group would be equal in their combined knowledge of the operations of the three participating companies and Connecticut Valley Power Exchange and so that each group would be compatible. On alternate weeks, one group of five men carried out the loading responsibilities while the other group participated in the classroom and field portion of the training program.

Classroom Objectives

The classroom and field portion of the training program was designed to carry out a desired objective in a limited time. In broad outline, it is based on a study made by the Pennsylvania Electric Association Systems Operation Committee and is as follows:

a. Orientation—2 days.
b. Technical Training
   Mathematics—2 days.
   Electrical Theory—8 days.
c. Basic Training—58 days.
d. On-the-Job Training—30 days.

Classroom presentations utilized lecture and discussion methods with emphasis being given to the latter. The entire program was geared to the practical consideration of preparing the trainees to start as System Operators and not to produce finished System Operators.

The technical training reviewed mathematics and electrical theory only up to that required in daily system operation with all problems and examples being taken from the log sheets of the participating companies. The basic training and on-the-job training portions of the program were interwoven to relieve possible monotony and to inspect equipment in the field shortly after class discussions on the equipment.

The 40 days devoted to operating instructions was the backbone of the basic training. During this time the operation of all generation and transmission equipment was discussed in detail until the instructor and the class had raised and answered all questions relating thereto.

For example, for an operating instruction covering a transmission line, matters discussed included

ownership, responsibility for maintenance, dispatching jurisdiction, normal connections, notification of changes in connections, capability of switches, interlocking, relays, load limits, supervisory control, automatic reclosing, metering, how to arrange for switching at unattended locations, abnormal operation, procedures to take the line out of service for work and locating faults.

The switching and tagging necessary to take the line out of service for work and return it to service was enacted at the trainees' suggestion, by the group as in actual operation with one man playing the role of System Operator and the others playing the roles of station operators, switchmen and workmen culminating in issuing the clearance to the workmen.

During these mock switching operations, all communications, clearance requests, clearance reports, switching, tagging, grounding and plugging of the System Diagram Board were handled as if in actual operation.

The enactment was followed by a constructive criticism period in which all joined by discussing ways by which the operation could have been improved.

After class study of the line, the group proceeded to the field study by inspecting the equipment and talking to station operators, switchmen and workmen concerning its operation. It was encouraging to see the trainees hold their own in these discussions and, as a result, observe confidence mount. After all components of the system were studied individually in this manner, the components were assembled and the operation of the system as a whole was studied by reviewing past system disturbances, reviewing a.c. board studies and study of hypothetical operating problems. In addition, each group received two days study on an a.c. board on present and future operating problems, many of which were contributed by the trainees.

Instructors for Course

The instructors were Connecticut Valley Power Exchange supervisors supplemented on specific subjects such as relays, safety and equipment nomenclature by supervisory personnel of the participating Companies.

After all material was covered except some remaining operating instructions and allied field trips, confidence and experience had grown to the point that it became possible to assign one man from each group as a discussion leader. Thereafter, the groups operated the classes with the former instructors acting as consultants. Audio and visual aids were used. These consisted of drawings, annual reports, maps, photos, sound-slide lectures, motion pictures, equipment, laboratory setups and text books covering mathematics, electrical theory, electric system operation, transmission and distribution systems, steam stations, hydro stations and relays.

16 Examinations Given

In order to keep the instructors and the trainees on the objective, 16 written examinations—roughly one per week—each containing 25 questions—were given during the program. Each examination was discussed, after corrected and graded papers were returned to the trainees.

These discussions proved to be of great benefit because previously unlearned material was assimilated at this time. In addition, unnumbered verbal questions were asked with the trainees having first chance at the answers.

The trainees introduced "bull sessions" to relieve the pressure of the training. These were used when a subject was completed too late in the day to start another. The trainees and instructor would take turns posing verbal questions with each trying good naturedly to stymie all the others.

A considerable esprit de corps had developed by this time. Although such items were not a part of The Outline for System Operator Training Program, they were constructive and served as our safety valve in keeping up interest in the work. The trainees contributed many such ideas for heightening interest with the instructors comparing notes and using all suggestions which did not retard the program.

About midway in the program, interest in the participating companies increased to the point where we set up a weekly schedule of classes, in advance, and invited others to attend the classes. Supervisors, operators and maintenance personnel of the participating companies "sat in" on the discussions, contributed information and, more importantly, provided an atmosphere for the build up of mutual respect and confidence.

At the end of the program an unlooked for extra month of time became available for each group. This was utilized for review and study of changes which were made in the system during the program. Before this period ended, the trainees were making hopeful inquiries concerning when they would get started in actual work.

Meanwhile, the shift position which the trainees were manning every other week did not remain quiet. Two new sharing units and the Connecticut Electric Exchange were placed in operation. The operation was moved from the former quarters to the new Connecticut Valley Power Exchange System Operating Center accompanied by changes in the communications and the telemetering systems. Manual control of tie lines was discontinued and the automatic tie line control equipment was placed in operation. Classroom time was devoted to these developments as required.

At the completion of the program, five of the men were appointed System Operator—A (the higher rated position) and three were appointed System Operator—B. From close experience in the training program, the appointments were valid to all concerned. Two of the trainees voluntarily withdrew from the program before its completion.

Results to Date

The physical facilities including the building, communications, telemetering, automatic tie line control equipment and the System Diagram Board are filling their intended purpose in a satisfactory manner.

The uniform operating practices established have been sufficient to enable Connecticut Valley Power Exchange to start its expanded operations. Additional work in this direction is possible.

(*Continued on page* 160)

CREDIT AND COLLECTION EXPERIENCE OF U. S. ELECTRIC AND GAS UTILITIES BY AREA—12 MONTHS ENDED DEC. 31, 1957

Per Cent Change From Corresponding Period—1956

	East North Central	East South Central	Middle Atlantic	Mountain	New England	Pacific	South Atlantic	West North Central	West South Central	United States
Sales (Dollars)	+ 7.5	+ 8.1	+ 5.2	+ 8.9	+ 6.3	+ 7.7	+ 9.0	+ 5.5	+ 9.1	+ 7.1
Customers	+ 3.0	+ 3.4	+ 1.0	+ 4.0	+ 1.3	+ 3.6	+ 4.1	+ 2.1	+ 2.4	+ 2.6
Outstanding in Dollars	+ 7.3	+27.4	+13.3	+12.1	+16.0	+ 5.3	+12.0	+11.3	+ 1.3	+10.9
Outstanding Per Cent of Sales	− 0.8	+17.4	+ 7.2	+ 2.8	+ 8.9	− 2.0	+ 2.8	+ 5.4	− 7.3	+ 3.1
Disconnect Notices	+16.3	+ 7.8	− 2.7	+12.3	+15.3	+18.0	+ 9.2	+16.5	+ 8.4	+ 8.2
Non-Payment Disconnections	+22.0	+16.8	− 4.8	+10.3	+ 8.4	+13.1	+ 7.2	+ 5.3	+ 7.8	+ 8.4
Deposits on Hand (Number)	+13.5	+ 0.9	+13.2	+ 6.8	− 0.7	− 5.6	+ 9.5	+ 9.8	+ 0.2	+ 6.8
Deposits on Hand (Dollars)	+18.6	+ 0.9	+15.5	+11.0	+ 7.4	+ 9.8	+ 8.5	+ 7.8	+ 3.4	+10.6
Final Bills (Number)	− 1.5	+ 1.4	− 4.7	+10.9	+22.0	+ 5.5	+ 9.1	− 7.1	+ 5.0	+ 2.6
Accounts Charged Off (Number)	+ 8.7	+ 6.7	+ 3.9	+ 4.3	+ 3.1	+21.2	+ 2.7	+ 5.1	+ 3.1	+ 8.6
Net Charge Off (Dollars)	+15.8	+ 9.3	+ 5.5	+12.5	+10.8	+23.8	+11.2	+20.8	+20.5	+14.3
Net Charge Off (Cents Per Customer)	+12.4	+ 5.7	+ 4.4	+ 8.2	+ 9.4	+19.5	+ 6.7	+18.3	+17.7	+ 7.9
Ratio—Net Charge Off to Sales	+11.8	+ 5.6	0	+ 4.3	+ 6.9	+12.0	+ 4.3	+13.3	+ 8.3	+ 5.0

The Credit Picture

Results of Survey Conducted Under Joint Supervision of the Credit and Collection Committees, EEI Accounting Division and AGA Accounting Section

A REVIEW of statistics for the 12-month period ended Dec. 31, 1957, as compared with the corresponding 12 months of 1956 for the United States as a whole, reveals that the 78 companies participating in this survey continued to enjoy steady increases in both sales and customers. The survey included 33 electric, 24 combination and 21 gas companies.

The percentage of increase in sales was approximately two-and-one-half times the increase in the number of customers, reflecting a sales increase of 7 per cent while total customers increased by approximately 2½ per cent. Percentagewise, the increase in both sales and customers was less than the 1955-56 trend, but the numerical increase in both categories remained about the same. Sales and customer growth were relatively consistent nationally.

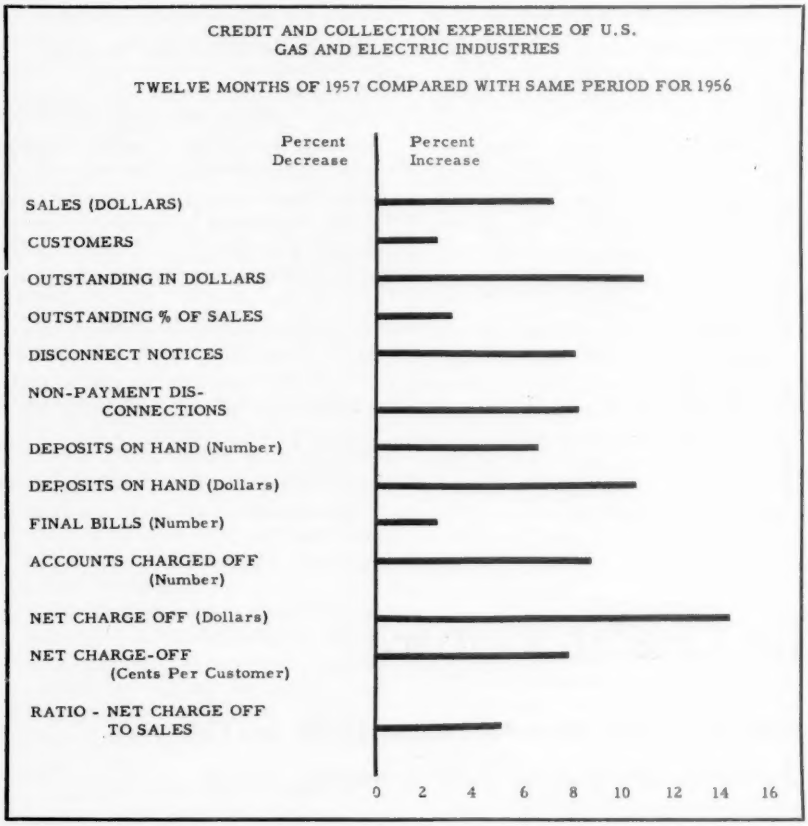
All areas, however, also experienced an increase in the total arrears outstanding as of Dec. 31, 1957, some at a rather concerning rate. Percentagewise, there was an 11 per cent overall increase in 1957 compared to 1956. From the previous report covering the 1955-56 years, an increase of only 6 per cent was evident. While less than one-third of the participating companies was able to report outstanding amounts for residential only, those who did, experienced a 14 per cent rise in arrears. The 1956 increase in total arrears was completely off-set by the increase in sales while in 1957 the per cent of arrears to sales over 1956 increased by more than 3 per cent, according to the reporting companies in the survey.

While 3 per cent may seem an inconsequential figure, it nevertheless represents an increase of 15 million dollars. In three areas, the outstanding per cent of sales was reduced from the 1955-56 period, with one area, the West South Central, declining more than 7 per cent. Gas company residential arrears showed the greatest increase by type of utility, going up nearly 35 per cent.

It is obvious that there has been concerted effort on the part of credit and collection men to combat the increasing outstanding arrears. A substantial increase in the number of disconnect notices, about 8 per cent, was observed but of more importance, the notices have apparently been followed up with stringent field action, resulting in a like increase of 8 per cent in the number of non-payment disconnections.

The number of deposits obtained has continued to grow in recent years and 1956-57 was no exception. Participating companies reported an increase of nearly 7 per cent in the total number of deposits required in 1957 compared to 1956. Data received on deposits covering residential accounts only are even more revealing. In the East North Central area, over 25 per cent more residential deposits were required for 38.5 per cent more money than in 1956.

Furthermore, the increase in total number of deposits and the dollar value were highest for all revenue classes in this particular area. Two areas, the New England and the Pacific, obtained fewer deposits than in previous years but the amount obtained was up substantially. In comparing deposit trends in the current report with the previous reporting period, 1955-56, the number and amount of deposits obtained increased 37 per cent and 21 per cent respectively, indicating the continued efforts by companies to protect themselves to a greater degree from mounting uncollectibles.


CREDIT AND COLLECTION EXPERIENCE OF U.S.
GAS AND ELECTRIC INDUSTRIES
TWELVE MONTHS OF 1957 COMPARED WITH SAME PERIOD FOR 1956
Percent Decrease
Percent Increase
SALES (DOLLARS)
CUSTOMERS
OUTSTANDING IN DOLLARS
OUTSTANDING % OF SALES
DISCONNECT NOTICES
NON-PAYMENT DIS-CONNECTIONS
DEPOSITS ON HAND (Number)
DEPOSITS ON HAND (Dollars)
FINAL BILLS (Number)
ACCOUNTS CHARGED OFF (Number)
NET CHARGE OFF (Dollars)
NET CHARGE-OFF (Cents Per Customer)
RATIO - NET CHARGE OFF TO SALES
0 2 4 6 8 10 12 14 16

The number of off-line final bills and the amounts represented are considered reliable indicators of loss potential by many observers. With the exception of one insignificant decrease, the *amount* of all final bills rendered in 1957 compared to 1956 has increased throughout the country, from a low of ½ of 1 per cent in the East South Central to a high of 22.6 per cent in the Mountain area. However, the overall increase is greatly reduced from the report submitted in 1957 comparing 1955 to 1956. An interesting trend has been observed in the case of gas companies as a group in that they received fewer requests for off-line final bills during 1957 while utilities as a whole increased by 2.6 per cent. The entire West North Central area joined the gas companies with a marked decrease in number of off-line final bills.

In reviewing the number of accounts charged off, an 83 per cent increase over that of the 1955-56 reports was observed although the increase in *amount* charged off declined for the same period. The gas industry appears to be in a more favorable position with the lowest increase in terms of dollars and number of charge-offs for the three groups of utilities. In three areas, the West North Central, the West South Central and the Pacific, increases exceeding 20 per cent in the amount charged off were reported in 1957 compared to 1956.

The net charge-off expressed in terms of cents per customer has continued to increase nation-wide, reaching a current figure of 31.13¢ compared to 28.85¢ in 1956, but the rate of increase has been reduced slightly from the 1955-56 comparison.

The index preferred by many utilities for evaluating the trend is the ratio of net charge-off to sales. Because most of the net charge-off is represented in residential accounts, it is especially significant to consider net charge-off as a per cent of residential sales, as well as a per cent of total sales. This is illustrated by the tabulation of data obtained from information reported by utilities participating in the Credit Picture Report. (Cols. 1 and 2, bottom.)

Ratio of Net Charge-Off to Sales, and Per Cent Increase

Companies	To Residential Sales			Companies	To Total Sales		
	1957	1956	% Inc.		1957	1956	% Inc.
20 Gas	0.41	0.41	0.0	21	0.30	0.29	3.4
33 Elec.	0.55	0.52	5.8	33	0.21	0.19	10.5
24 Comb.	0.42	0.39	7.7	24	0.18	0.17	5.9
All	0.44	0.43	2.3	All	0.21	0.20	5.0

Problem of Credit, Collection

Utility uncollectibles even during years of prosperity have generally continued to increase dollar-wise and in ratio to sales. This trend is usually attributed to the transient nature of the population and over-extension of credit. In addition, the extended use of gas and electric service for space heating and air conditioning purposes plus the use of numerous additional appliances in the home has materially affected the size of the average customer's bills and consequently the size of the average bill charged off. A sharp decline in the economy of the nation late in 1957, particularly in some areas, and continued unemployment this far in 1958 pose a real problem to those responsible for credit and collection operations.

We Will Help

(*Continued from page* 138)

to impress foreign observers. It has been an orderly effort based on human intelligence and the proper use of money, materials and men. That is the approach that has produced the greatest industrial system the world has ever known and there is good reason to suppose that this approach is fully applicable to the development of nuclear power.

Won't Be Buried

We are free people, and we would like to stay that way. The Russians have no such incentive as that. We of the power industry pledge our support to every honest effort made to bolster our national position. We will take the course which appears most reasonably consonant with our national principles and purpose.

There can be no doubt as to the outcome. Mr. Khrushchev will not bury us.

Personals

W. A. Parish, president of Houston Lighting & Power Co., has been named chairman of the board of directors and chief executive officer, and **T. H. Wharton,** executive vice president, was elected president and chief administrative officer. **P. H. Robinson,** vice president in charge of operations of the company, becomes executive vice president.

W. A. PARISH

T. H. WHARTON

Mr. Parish, who was elected president of the utility in 1953, has been with the company since 1914, when the law firm with which he was an attorney was appointed legal counsel to the company. He was elected to the board in 1917 and in 1927 became vice president. In 1935 he was named to the executive committee. He was graduated from the University of Texas in 1910 with an LL. B. degree, and was admitted to the bar that same year. Long active in the affairs of EEI, he is a former member of the Institute's board of directors.

Mr. Wharton joined the company in 1922, and was made comptroller in 1944, a director in 1946 and a vice president in 1949. In 1953 he was elected executive vice president, having served before that time as financial vice president.

During Mr. Robinson's 30 years with the electric utility company, he has been transmission and relay engineer, industrial sales engineer, superintendent of industrial sales and assistant vice president.

A. H. McDowell, Jr., system manager of operations, Virginia Electric and Power Co., has been elected president, and **Erwin H. Will,** president, was elected vice chairman of the board and chairman of the company's executive committee. **W. Tayloe Murphy** was appointed to the executive committee and **George D. Gibson** to general counsel. The late **T. Justin Moore** was chairman of the executive committee and general counsel.

Mr. McDowell joined the company 30 years ago, following his graduation from VMI in 1928 with a degree in civil engineering. He was made executive assistant to the president in 1946 and became Richmond district manager in 1953. In 1955 he was made division manager and was promoted to system manager of operations in 1956. He was a lieutenant commander in the U. S. Navy in World War II. He is active in the Richmond and Virginia Chambers of Commerce.

Mr. Will has been with the utility 36 years. He joined Vepco in 1922 after graduation from Virginia Polytechnic Institute. In 1935 he accepted a position with the El Paso Electric Co., where he served for five years as president, and returned to Richmond in 1947. Upon rejoining Vepco, he was made general manager of operations and in 1950 was elected vice president of operations. In 1955 he was elected vice president and general manager and in 1956 president. A member of the EEI board of directors, Mr. Will has been active in civic affairs in Richmond and has served on a number of boards of city and state organizations.

Mr. Murphy has been a member of the Vepco board of directors since 1950 and Mr. Gibson is a senior partner in the firm of Hunton, Williams, Gay, Moore and Powell, and has been associate general counsel of Vepco since 1956.

ERWIN H. WILL

A. H. MCDOWELL, JR.

George J. Kuehnle, Jr., director of community relations, The Cincinnati Gas & Electric Co., was elected vice president of the company, and **Miles J. Doan,** assistant treasurer, was elected secretary and assistant trea-

surer. Mr. Kuehnle joined CG&E in 1933 as a power sales engineer in the electric sales department. From 1949 to 1954, when he was named director of community relations, he headed the Northern division. Mr. Doan received his masters degree in business administration from the University of Michigan. He joined the company in 1949.

Shermer L. Sibley, vice president-assistant general manager, Pacific Gas and Electric Co. has been named vice president-general manager of the utility. **Arthur J. Swank,** vice president-general construction, was advanced to vice president-electric operations. **Herbert W. Haberkorn,** manager of hydroelectric construction, was named vice president-general construction.

Mr. Sibley has been v.p.-assistant general manager for three years. The general manager's duties had been performed by the president of the utility since 1950. Mr. Swank replaces the retiring **George A. Peers.** Mr. Haberkorn has been with the company 37 years.

Three new executive vice presidents and two new vice presidents have been elected by Public Service Co. of Colorado. **M. M. Koch,** vice president, becomes executive v. p. in charge of electric operations; **R. T. Person,** a vice president since 1956, becomes executive v. p. of advertising and publicity. W. D. Virtue, as executive v. p., retains his position of company treasurer.

O. P. Reed, manager of employee relations since 1957, continues these duties as vice president. **D. J. Miller** becomes vice president-gas operations, succeeding retiring **F. T. Parks.**

J. H. Clawson, treasurer of Puget Sound Power & Light Co., has been elected vice president of the company. He will continue in the same capacity—the position he has held since 1947. A former auditor for Stone & Webster Inc., he joined PSP&L in 1933. He has also served the company as assistant treasurer and controller.

Elmer H. Lother, treasurer of the Narragansett Electric Co., has been elected vice president and comptroller of the New England Power Service Co., a subsidiary of the New England Electric System. He joined Narragansett in 1920, and by 1928 had advanced to auditor of that company. Two years later he transferred to NEES, where he was made assistant general auditor of that system. He then was appointed treasurer of Narragansett.

Thomas E. Hurns, who rose from office boy to vice president and secretary of The Detroit Edison Co. during his 49-year career with the company, retired May 1. When he joined the company in 1909, he was one of 500 employees of the utility serving 40,000 customers on a system with a total generating capacity of 28,000 kw. Today, the company's 11,000 employees serve an area inhabited by 4,000,000 people and the system capacity is 3,000,000 kw. His work with the company established him as an authority on tax and accounting problems throughout the entire electric industry. He was associated with the EEI Taxation Accounting Committee and many other organizations.

R. H. Thompson, manager of the Eastern division of Central Illinois Public Service Co., was recently elected vice president of the company.

Floyd L. Larkin, vice president in charge of industrial relations, Wisconsin Electric Power Co., has been elected president of the Wisconsin Utilities Association. He succeeds **S. Lloyd Nemeyer,** president of the Milwaukee Gas Light Co., who was elevated to board chairman, **Stuart V. Willson,** president of the Northern States Power Co. (Wis.), was re-elected vice president. **Earl G. Frank,** secretary of the Milwaukee Gas Light Co., was re-elected treasurer.

How We Selected and Trained System Operators

(*Continued from page* 156)

The five step selection procedure was effective as demonstrated by the performance of the men during the training program and in the limited operating experience to date. Aptitude testing is an invaluable professional tool for use in the selection procedure in that it provides an additional yardstick to check the other yardsticks used for this purpose.

Use of aptitude tests provides additional benefits such as satisfying the more experienced men that all possible effort is being made to bring in men to carry their share of the load; men who are eliminated are satisfied that they have received fair and complete consideration and as an aid in understanding and supervising the men. Use of this additional yardstick widens the field of selection in that men of limited experience but good potential can be considered.

The training program served its intended purpose of preparing men to start work in a completely new position and atmosphere with the confidence of men trained by on-the-job methods for an existing position. The efficiency of prepared classroom presentations and discussions shortens training time as compared to on-the-job methods.

Purchasing and Stores Annual Meeting

(*Continued from page* 134)

Service, Inc., reported that a review of information submitted to a subcommittee which studied "physical inventories" indicated the trend of extending inventory periods. The study report indicated that perhaps the relation of inventory adjustment to the total value of material issued could be used as a yardstick to determine the frequency of taking inventory. Or perhaps this same yardstick could be used for determining the frequency of inventories by classes of material.

The report concluded that management must be assured, through verification by physical count, that the books reflect the asset value of the material and supplies on hand. Also, frequency of inventories may hinge on such things as the requirements of public authorities or some other need that may exist for adequate inventory control.

EDISON ELECTRIC INSTITUTE OFFICERS AND COMMITTEES

OFFICERS

J. W. McAfee, *President*.....Union Electric Co., St. Louis, Mo.
J. E. Corette, *Vice President*.....The Montana Power Co., Butte, Mont.
Edwin Vennard, *Vice President and Managing Director*....750 Third Ave., New York, N. Y.
H. S. Sutton, *Treasurer*.....Consolidated Edison Co. of New York, Inc., New York, N. Y.
A. B. Morgan, *Secretary and Assistant Managing Director*.....750 Third Ave., New York, N. Y.

BOARD OF DIRECTORS

(*Terms expiring 1958*)

J. L. Bates.....Central Power and Light Co., Corpus Christi, Texas
A. M. Beebee.....Rochester Gas and Electric Corp., Rochester, N. Y.
F. D. Campbell.....Cambridge Electric Light Co., Cambridge, Mass.
C. B. Delafield.....Consolidated Edison Co. of New York, Inc., New York, N. Y.
R. Roy Dunn.....Potomac Electric Power Co., Washington, D. C.
R. H. Gerdes.....Pacific Gas and Electric Co., San Francisco, Calif.
N. B. Gussett.....Iowa Power and Light Co., Des Moines, Iowa
E. L. Lindseth.....The Cleveland Electric Illuminating Co., Cleveland, Ohio
D. C. Luce.....Public Service Electric and Gas Co., Newark, N. J.
M. S. Luthringer.....Central Illinois Public Service Co., Springfield, Ill.
C. E. Oakes.....Pennsylvania Power & Light Co., Allentown, Pa.
H. T. Pritchard.....Indianapolis Power & Light Co., Indianapolis, Ind.
K. M. Robinson.....The Washington Water Power Co., Spokane, Wash.
Harold Turner.....American Electric Power Service Corp., New York, N. Y.

(*Terms expiring 1959*)

H. J. Cadwell.....Western Massachusetts Electric Co., Greenfield, Mass.
Stuart Cooper.....Delaware Power & Light Co., Wilmington, Del.
Carl J. Forsberg.....Wisconsin Power and Light Co., Madison, Wis.
Allen S. King.....Northern States Power Co., Minneapolis, Minn.
C. E. Kohlhepp.....Jersey Central Power & Light Co., Asbury Park, N. J.
C. R. Landrigan.....The Detroit Edison Co., Detroit, Mich.
J. E. Loiseau.....Public Service Co. of Colorado, Denver, Colo.
Earle J. Machold.....Niagara Mohawk Power Corp., Syracuse, N. Y.
D. C. McKee.....The Empire District Electric Co., Joplin, Mo.
P. H. Powers.....West Penn Power Co., Greensburg, Pa.
R. G. Rincliffe.....Philadelphia Electric Co., Philadelphia, Pa.
R. E. Ritchie.....Arkansas Power & Light Co., Little Rock, Ark.
W. H. Sammis.....Ohio Edison Co., Akron, Ohio
J. R. Welsh.....Southwestern Gas and Electric Co., Shreveport, La.
Erwin H. Will.....Virginia Electric and Power Co., Richmond, Va.

(*Terms expiring 1960*)

W. C. Beckjord.....The Cincinnati Gas & Electric Co., Cincinnati, Ohio
W. C. Bell.....The United Illuminating Co., New Haven, Conn.
N. A. Cocke.....Duke Power Co., Charlotte, N. C.
J. F. Davenport.....Southern California Edison Co., Los Angeles, Calif.
T. W. Delzell.....Portland General Electric Co., Portland, Ore.
G. S. Dinwiddie.....New Orleans Public Service Inc., New Orleans, La.
Willis Gale.....Commonwealth Edison Co., Chicago, Ill.
M. L. Kapp.....Interstate Power Co., Dubuque, Iowa
W. T. Lucking.....Arizona Public Service Co., Phoenix, Ariz.
W. W. Lynch.....Texas Power & Light Co., Dallas, Texas
L. C. McClurkin.....Savannah Electric and Power Co., Savannah, Ga.
J. J. McDonough.....Georgia Power Co., Atlanta, Ga.
A. R. Schiller.....Public Service Co. of New Hampshire, Manchester, N. H.
G. W. Van Derzee.....Wisconsin Electric Power Co., Milwaukee, Wis.
J. Theodore Wolfe.....Baltimore Gas and Electric Co., Baltimore, Md.

Executive Committee

C. B. Delafield, R. R. Dunn, A. S. King, E. L. Lindseth, C. E. Oakes, R. G. Rincliffe
K. M. Robinson, W. H. Sammis, G. W. Van Derzee

EDISON ELECTRIC INSTITUTE OFFICERS AND COMMITTEES

ADVISORY COMMITTEE 1957-1958

D. C. BARNES.....Virginia Electric and Power Co.
A. D. BARNEY.....The Hartford Electric Light Co.
J. B. BLACK.....Pacific Gas and Electric Co.
HARLLEE BRANCH, JR.....The Southern Co
W. L. CISLER.....The Detroit Edison Co.
C. P. CRANE.....Baltimore Gas and Electric Co.
T. G. DIGNAN.....Boston Edison Co.
EDGAR H. DIXON.....Middle South Utilities, Inc.
PHILIP A. FLEGER.....Duquesne Light Co.
GEORGE M. GADSBY.....Utah Power & Light Co.
D. E. KARN.....Consumers Power Co.
GEORGE L. MACGREGOR.....Texas Utilities Co.
PAUL B. MCKEE.....Pacific Power & Light Co.
L. L. MOORE.....New England Electric System
W. C. MULLENDORE....Southern California Edison Co.
GROVER C. NEFF.....Wisconsin Power and Light Co.
J. S. OSBORNE.....Central & South West Corp.
PHILIP SPORN.....American Electric Power Co., Inc.
L. V. SUTTON.....Carolina Power & Light Co.
FRANK M. TAIT.....The Dayton Power and Light Co.
J. B. THOMAS.....Texas Electric Service Co.
E. S. THOMPSON....The West Penn Electric Co. (Inc.)
ALLEN VAN WYCK.....Illinois Power Co.

CHAIRMEN OF EDISON ELECTRIC INSTITUTE COMMITTEES (1957-1958)

ACCOUNTING

Accounting Division Executive, J. D. ELLIOTT.....The Detroit Edison Co., Detroit, Mich.
Coordinator of Customer Activities Group, C. J. BERNER.....Wisconsin Electric Power Co., Milwaukee, Wis.
Customer Accounting, M. F. YOUNG.....The Connecticut Light & Power Co., Hartford, Conn.
Customer Collections, J. E. HEVRON.....New Orleans Public Service Inc., New Orleans, La.
Customer Relations, H. R. POTTS.....Columbus and Southern Ohio Electric Co., Columbus, Ohio
Coordinator of General Activities Group, P. R. LAWSON.....Pennsylvania Electric Co., Johnstown, Pa.
Depreciation Accounting, O. E. SMITH.....Baltimore Gas and Electric Co., Baltimore, Md.
General Accounting, G. F. JONES.....Potomac Electric Power Co., Washington, D. C.
Internal Auditing, R. B. TRITTON.....The Cleveland Electric Illuminating Co., Cleveland, Ohio
Plant Accounting and Property Records, G. A. BROWNMILLER....The Connecticut Light & Power Co., Hartford, Conn.
Taxation Accounting, C. E. YORK.....The Cincinnati Gas & Electric Co., Cincinnati, Ohio
Coordinator of Special Activities Group, C. T. DWIGHT.....The Hartford Electric Light Co., Hartford, Conn.
Accounting Development Service, A. H. KERN.....Alabama Power Co., Birmingham, Ala.
Accounting Employee Relations, J. J. LEARY.....Boston Edison Co., Boston, Mass.
Application of Accounting Principles, V. A. KOS.....Commonwealth Edison Co., Chicago, Ill.
Electronic Accounting Machine Developments, R. W. BRITT.....Wisconsin Electric Power Co., Milwaukee, Wis.
Uniform System of Accounts, R. G. SCHNEIDER.....Virginia Electric and Power Co., Richmond, Va.

COMMERCIAL

Commercial Division Executive, T. O. MCQUISTON.....Metropolitan Edison Co., Reading, Pa.
Commercial Sales Group, H. R. JONES.....West Penn Power Co., Greensburg, Pa.
Farm Group, M. O. WHITHED.....Atlantic City Electric Co., Atlantic City, N. J.
Industrial Power & Heating Group, F. E. WIATT.....The Cincinnati Gas & Electric Co., Cincinnati, Ohio
Residential Group, ROBERT L. COE.....Union Electric Co., St. Louis, Mo.
Special Services Group, B. L. PALM.....Central Illinois Public Service Co., Springfield, Ill.

ENGINEERING

Engineering & Operating Division Executive, C. W. FRANKLIN...Consolidated Edison Co. of N. Y., Inc., New York, N. Y.
Electrical System & Equipment, H. E. DEARDORFF.....The Dayton Power and Light Co., Dayton, Ohio
Hydraulic Power, E. S. HARRISON.....Georgia Power Co., Atlanta, Ga.
Meter & Service, FLOYD SALMON.....Central Power and Light Co., Corpus Christi, Texas
Prime Movers, V. L. STONE.....Commonwealth Edison Co., Chicago, Ill.
Transmission & Distribution, W. M. PENNEY.....Union Electric Co., St. Louis, Mo.

GENERAL

General Division Executive, J. E. CORETTE.....The Montana Power Co., Butte, Mont.
Accident Prevention, I. R. DOHR.....Consumers Power Co., Jackson, Mich.
Area Development, S. F. MCGOWAN.....Northern States Power Co., Minneapolis, Minn.
Atomic Power, E. L. LINDSETH.....The Cleveland Electric Illuminating Co., Cleveland, Ohio
Awards, M. C. ALBRITTAIN.....Baltimore Gas and Electric Co., Baltimore, Md.
Electric Power Survey, ARTHER S. GRISWOLD.....The Detroit Edison Co., Detroit, Mich.
Financing & Investor Relations, L. E. REYNOLDS.....The Connecticut Light & Power Co., Hartford, Conn.
Industrial Relations, E. J. BRILL.....Pennsylvania Power & Light Co., Allentown, Pa.
Insurance, D. E. WILLIAMS.....The Cleveland Electric Illuminating Co., Cleveland, Ohio
Legal, J. M. KEEGAN.....Consolidated Edison Co. of New York, Inc., New York, N. Y.
Membership, E. S. THOMPSON.....The West Penn Electric Co. (Inc.), New York, N. Y.
Purchasing and Stores, T. S. DUNSTAN.....Consolidated Edison Co. of New York, Inc., New York, N. Y.
Rate Research, L. W. FRANK.....Western Massachusetts Electric Co., Springfield, Mass.
Regulation, C. E. KOHLHEPP.....New Jersey Power & Light Co., Denville, N. J.
Research Projects, E. H. SNYDER.....Public Service Electric and Gas Co., Newark, N. J.
Statistical, A. E. BUSH.....The Detroit Edison Co., Detroit, Mich.
Tax Policy, C. B. MCMANUS.....The Southern Co., Atlanta, Ga.
Technical Assistance for Overseas Visitors, HARVEY BUMGARDNER.....The Detroit Edison Co., Detroit, Mich.
Transportation, R. E. HAMEL.....The Cleveland Electric Illuminating Co., Cleveland, Ohio

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